Vol. 1047 Number 5

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

October 30, 1984

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
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Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 30, 1984 Volume 1047 Number 5


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| Patents Granted | |
| General and Mechanical (4,479,267) | 1867 |
| Chemical (4,479,803) | 2059 |
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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

| | |
|---|---|
| Transmittal fee | $ 125.00 |
| Search fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| · No corresponding prior U.S. national application filed | 500.00 |
| · Corresponding prior U.S. national application filed | 250.00 |
| European Patent Office as Searching Authority | |
| · All cases | 620.00 |
| International Fees | |
| Basic fee (first 30 pages) | 295.00 |
| Basic Supplemental fee (for each page over 30) | 6.00 |
| Designation fee (for each national or regional office) | 70.00 |

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

Apr. 13, 1984.

### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 27, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

| | |
|---|---|
| Plant Patents | 4,781 through 4,783 |
| Utility Patents | 4,296,497 through 4,297,745 |

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

| | |
|---|---|
| By a small entity (§1.9(f)) | $ 200.00 |
| By other than a small entity | $ 400.00" |

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

| | |
|---|---|
| By a small entity (§1.9(f)) | $ 50.00 |
| By other than a small entity | $ 100.00" |

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . $ 500.00"

### Board of Appeals Decisions Rendered in the Month of Sept. 1984

| | |
|---|---|
| Affirmed | 190 |
| Affirmed in Part | 26 |
| Reversed | 82 |
| Total | 298 |

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,887,768,** Re. S.N. 621,127, Filed June 15, 1984, Cl. 375/37, SIGNAL STRUCTURES FOR DOUBLE SIDE BAND-QUADRATURE CARRIER MODULATION, George D. Forney, Jr., et al., Owner of Record: *Codex Corp., Newton, Mass.*, Attorney or Agent: Robert E. Hillman, et al., Ex. Gp.: 263

**4,308,596,** Re. S.N. 566,914, Filed Dec. 29, 1983, Cl. 365/218, MEMORY DRIVING METHOD, Atsushi Takai, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 235

**4,325,565,** Re. S.N. 457,759, Filed Aug. 14, 1984, Cl. 280/282, CAMBERING VEHICLE, Frank J. Winchell,

Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: Charles R. White, et al., Ex. Gp.: 316

**4,326,588,** Re. S.N. 603,629, Filed Apr. 25, 1984, Cl. 166/387, WELL TOOL HAVING KNITTED WIRE MESH SEAL MEANS AND METHOD OF USE THEREOF, David M. McStravick, Owner of Record: *Baker International Corp., Orange, Calif.*, Attorney or Agent: William C. Norvell, Jr., et al., Ex. Gp.: 356

**4,330,740,** Re. S.N. 477,567, Filed Mar. 21, 1983, Cl. 318/780, ENERGIZING CIRCUIT FOR PROVIDING LOW VOLTAGE STARTING FOR SUBMERSIBLE PUMP MOTOR, Lewis R. Shell, et al., Owner of Record: *Hughes Tool Co., Houston, Tex.*, Attorney or Agent: Robert A. Felsman, et al., Ex. Gp.: 217

**4,381,324,** Re. S.N. 619,390, Filed June 11, 1984, Cl. 428/58, COUPLING MEMBER FOR FLOOR COVERING SECTIONS, Chester W. Ellingson, Jr., Owner of Record: *Reese Enterprises, Inc., Rosemount, Minn.*, Attorney or Agent: Leo Gregory, Ex. Gp.: 156

**4,419,416,** Re. S.N. 616,506, Filed Apr. 24, 1984, Cl. 428,656, OVERLAY COATINGS FOR SUPERALLOYS, Dinesh K. Gupta, et al., Owner of Record: *United Technologies Corp., Hartford, Conn.*, Attorney or Agent: Charles E. Sohl, Ex. Gp.: 111

**4,428,714,** Re. S.N. 610,511, Filed May 15, 1984, Cl. 415/161, PRE-SWIRL INLET GUIDE VANES FOR COMPRESSOR, Rolf J. Mowill, Owner of Record: *A/S Kongsberg Vapenfabrikk, Kongsberg, Norway*, Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 243

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## REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**3,714,786,** Reexam. No. 90/000,620, Requested: Sept. 7, 1984, Cl. 405/049, DRAINAGE CULVERT, Ralph E. Evans, et al., Owner of Record: *Armco, Inc., Middletown, Ohio*, Attorney or Agent: Frost & Jacobs, Ex. Gp.: 313, Requester: Townsend & Townsend, San Francisco, Calif.

**3,761,950,** Reexam. No. 90/000,628, Requested: Sept. 14, 1984, Cl. 346/68, X-Y PLOTTER, John O. Yeiser, Owner of Record: *By Mesne Assigts to Bausch & Lomb, Inc., Rochester, N.Y.*, Attorney or Agent: Lawrence Fleming, Ex. Gp.: 216, Requester: Hewlett Packard Co., Colorado Springs, Colo.

**3,874,852,** Reexam. No. 90/000,632, Requested: Sept. 19, 1984, Cl. 436/63, REAGENT AND METHOD FOR DETERMINING LEUKOCYTES AND HEMOGLOBIN IN THE BLOOD, Thomas E. Hamil, Owner of Record: *Coulter Electronics, Inc., Hialeah, Fla.*, Attorney or Agent: Gerald R. Hibnick, Ex. Gp.: 134, Requester: Coulter Electronics, Inc., Hialeah, Fla.

**3,995,102,** Reexam. No. 90/000,635, Requested: Sept. 21, 1984, Cl. 174/48, INSERT DEVICE FOR CABLES, John E. Kohaut, Owner of Record: *Raceway Components, Inc., Nutley, N.J.*, Attorney or Agent: Howard Sommers, Ex. Gp.: 210, Requester: Butler Mftg. Co., Kansas City, Mo.

**4,099,020,** Reexam. No. 90/000,633, Requested: Sept. 21, 1984, Cl. 174/48, APPARATUS FOR SEALING PASSAGES THROUGH A CONCRETE FLOOR AND ABOUT A CONDUCTOR, John E. Kohaut, Owner of Record: *Raceway Components, Inc., Nutley, N.J.*, Attorney or Agent: Howard Sommers, Ex. Gp.: 310, Requester: Butler Mftg. Co., Kansas City, Mo.

**4,186,982,** Reexam. No. 90/000,640, Requested: Sept. 28, 1984, Cl. 339/17C, CONTACT WITH SPLIT PORTION FOR ENGAGEMENT WITH SUBSTRATE, Robert F. Cobaugh, et al., Owner of Record: *Requester*, Attorney or Agent: Willian, et al., Ex. Gp.: 322, Requester: AMP, Inc., Harrisburg, Pa.

**4,251,648,** Reexam. No. 90/000,634, Requested: Sept. 21, 1984, Cl. 525/187, PEROXIDE CURED EPIHALOHYDRIN POLYMERS, John T. Oetzel, Owner of Record: *The B. F. Goodrich Co., New York, N.Y.*, Attorney or Agent: J. Hughes Powell, Jr., Ex. Gp.: 151, Requester: Hercules, Inc., Wilmington, Del.

**4,300,523,** Reexam. No. 90/000,638, Requested: Sept. 24, 1984, Cl. 126/21A, BARBECUE OVEN, Berthal B. and Michael L. Robertson, Owner of Record: *B. B. Robertson Co., Marion, Ill.*, Attorney or Agent: Gravely, et al., Ex. Gp.: 345, Requester: B. B. Robertson Co., St. Louis, Mo.

**4,413,737,** Reexam. No. 90/000,636, Requested: Sept. 24, 1984, Cl. 206/599, SHIPPING PALLET AND A PACKAGE FORMED THEREFROM, Joseph H. Wind, Owner of Record: *Biglow-Sanford, Inc., Greenville, S.C.*, Attorney or Agent: Bell, et al., Ex. Gp.: 241, Requester: Electro-General Plastics Corp., Shaker Height, Ohio

**4,439,130,** Reexam. No. 90/000,639, Requested: Sept. 25, 1984, Cl. 425/388, PLASTIC TILE CORRUGATOR, Heinrich Dickhut, et al., Owner of Record: *Cullom Machine Tool & Die, Inc., Cullom, Ill.*, Attorney or Agent: Wood, et al., Ex. Gp.: 130, Requester: Corma, Inc., Concord, Ontario, Canada

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### Assignments Affecting Applications of Joint Inventors

Over the past several years, the Assignment Branch of the Patent and Trademark Office has been charging a single fee for recording the assignment of a patent or patent application of joint inventors when separate assignment documents are executed by the joint inventors and then filed together for recording.

This practice is in error because it conflicts with 37 CFR 1.21 Miscellaneous Fees and Charges (h) Recording of Documents which states:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or applications . . . . . $20.00.

Effective Nov. 1, 1984, the Assignment Branch will charge in accordance with the above regulation, the fee of $20.00 for each assignment document of the joint inventors which relates to the patent or patent applications.

THERESA A. BRELSFORD,
*Assistant Commissioner for Administration.*

Oct. 1, 1984.

**Status of PTO Services**

The following is an update of the status of PTO services for September 1984:

| Service Item | FY 1984 Performance Goal (Calendar Days) | Actual | Comment |
|---|---|---|---|
| Filing Receipts: | | | |
| Patents | 22 | 33 | |
| Trademarks | 30 | 34 | |
| Patent/Trademark Copies: | | | |
| Window Coupons | 5 | 92% within 5 days | New contractor improved 16% since last month. |
| Mail Coupons | 29 | 99% within 29 days* | |
| Letter Orders | 34 | 99% within 34 days* | |
| Date of oldest unfilled order | | September 18, 1984 | |
| Certified Copies: | | | |
| Trademark Registrations | 30 | 22 | |
| Applications-As-Filed | 20 | 99% within 15 days | |
| File-Wrapper/Contents | N/A | 99% within 7 days | |
| Walk-up Certification | 1 | 99% within 1 day | |
| Trademark Search Library: | | | |
| Filing Drawings | 21 | 13 | |
| Filing Reg. Certificates | 3 | 6 | |
| Assignments: | | | |
| Patents | 25 | 20 | |
| Trademarks | 25 | 19 | |
| Avg. Days from Issue Fee Payment to Issue Date | 90-100 | 88 | |
| Patent Official Gazette: | | | |
| In Bookstore | Issue Date | On schedule | |
| Mailed | Issue Date | Avg. 1 day late | |
| Patent Grants Mailed | Issue Date | Avg. 3 days late | |
| Patent Copies Available | Issue Date | 90% on issue date | |
| Trademark Copies Available | Issue Date | On schedule | |
| Trademark Official Gazette: | | | |
| In Bookstore | Issue Date | On schedule | |
| Mailed | Issue Date | On schedule | |
| Trademark Regs. Mailed | Issue Date | On schedule | |

*Figures include mail processing and delivery time.

Oct. 5, 1984.

THERESA A. BRELSFORD,
*Assistant Commissioner*
*for Administration.*

# PATENT NOTICES

**Certificates of Correction for the Week of Oct. 30, 1984**

| | | | |
|---|---|---|---|
| Re. 31,470 | 4,414,417 | 4,438,830 | 4,446,502 |
| D. 269,456 | 4,417,967 | 4,439,048 | 4,447,307 |
| D. 271,907 | 4,419,657 | 4,439,558 | 4,447,659 |
| 4,110,404 | 4,423,221 | 4,440,479 | 4,447,924 |
| 4,217,297 | 4,424,470 | 4,440,655 | 4,448,970 |
| 4,235,070 | 4,426,235 | 4,441,573 | 4,449,480 |
| 4,239,629 | 4,427,080 | 4,441,616 | 4,449,618 |
| 4,294,004 | 4,427,573 | 4,441,649 | 4,449,867 |
| 4,314,202 | 4,428,142 | 4,442,025 | 4,451,148 |
| 4,320,191 | 4,428,417 | 4,442,255 | 4,451,402 |
| 4,340,585 | 4,428,973 | 4,442,597 | 4,452,128 |
| 4,342,775 | 4,431,662 | 4,443,025 | 4,452,578 |
| 4,351,053 | 4,431,779 | 4,443,049 | 4,453,024 |
| 4,354,057 | 4,432,847 | 4,443,150 | 4,453,565 |
| 4,363,718 | 4,433,377 | 4,443,472 | 4,454,130 |
| 4,363,820 | 4,434,053 | 4,443,580 | 4,454,554 |
| 4,370,808 | 4,434,175 | 4,443,876 | 4,454,596 |
| 4,372,226 | 4,434,182 | 4,444,123 | 4,454,955 |
| 4,376,713 | 4,434,632 | 4,444,190 | 4,455,376 |
| 4,390,053 | 4,435,287 | 4,444,309 | 4,455,607 |
| 4,390,651 | 4,435,371 | 4,444,574 | 4,455,837 |
| 4,391,184 | 4,435,535 | 4,444,578 | 4,456,405 |
| 4,394,588 | 4,436,388 | 4,444,770 | 4,456,534 |
| 4,395,424 | 4,436,399 | 4,444,844 | 4,456,950 |
| 4,396,522 | 4,436,610 | 4,444,864 | 4,457,492 |
| 4,397,825 | 4,436,848 | 4,445,200 | 4,457,512 |
| 4,399,882 | 4,436,962 | 4,445,242 | 4,457,567 |
| 4,402,220 | 4,436,963 | 4,445,246 | 4,458,048 |
| 4,405,698 | 4,437,187 | 4,445,432 | 4,458,633 |
| 4,409,707 | 4,437,375 | 4,445,477 | 4,460,656 |
| 4,410,099 | 4,438,275 | 4,445,540 | 4,465,628 |
| 4,410,904 | 4,438,289 | 4,445,840 | |
| 4,412,007 | 4,438,607 | 4,446,119 | |

**Disclaimers**

4,243,155.—*Maurice M. Stewart*, West Bloomfield, Mich. VALVING AND AUTOMATIC PRESSURE REGULATOR FOR INHALATION APPARATUS. Patent dated Jan. 6, 1981. Disclaimer filed May 14, 1984, by the assignee, *Oxygen Therapy Institute, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,361,834.—*Johnnie L. King*, Wagarville, Ala. SAFETY ALARM DEVICE. Patent dated Nov. 30, 1982. Disclaimer filed Aug. 24, 1984, by the inventor.

The term of this patent subsequent to July 31, 1998 has been disclaimed.

4,394,508.—*Ronnie R. Crenshaw*, Dewitt and *Aldo A. Algieri*, Fayetteville, N.Y. CHEMICAL COMPOUNDS. Patent dated July 19, 1983. Disclaimer filed Sept. 10, 1984, by the assignee, *Bristol-Myers Co.*

Hereby enters this disclaimer to claim 43 of said patent.

4,432,832.—*Stephen Fantone*, Saugus, Mass. METHOD OF FORMING CONTOURED OPTICAL LAYERS ON GLASS ELEMENTS. Patent dated Feb. 21, 1984. Disclaimer filed Aug. 31, 1984, by the assignee, *Polaroid Corp.*

Hereby enters this disclaimer to claims 1–6 of said patent.

**Dedication**

4,423,018.—*J. Harvey Lester, Jr.*, and *Donald E. Danly*, Pensacola, Fla. BUFFERED FLUE GAS SCRUBBING SYSTEM USING ADIPIC ACID BY-PRODUCT STREAM. Patent dated Dec. 27, 1983. Dedication filed Aug. 17, 1984, by the assignee, *Monsanto Co.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Auburn University Libraries | (205) 826-4500 Ext.21 |
| | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7140 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | San Diego Public Library | (619) 236-5813 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 571-2122 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Florida | Miami–Dade Public Library | (305) 579-5001 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4508 |
| Idaho | Moscow: University of Idaho Library | (208) 885-6235 |
| Illinois | Chicago Public Library | (312) 269-2865 |
| | Springfield: Illinois State Library | (217) 782-5430 |
| Indiana | Indianapolis–Marion County Public Library | (317) 269-1706 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Maryland | College Park: Engineering and Physical Sciences Library, University of Maryland | (301) 454-3037 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Ann Arbor: Engineering Transportation Library, University of Michigan | (313) 764-7494 |
| | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6670 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 390, Ext. 391 |
| Montana | Butte: Montana College of Mineral Science and Technology Library | (406) 496-4283 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| Nevada | Reno: University of Nevada Library | (702) 784-6579 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7815 |
| New Mexico | Albuquerque: University of New Mexico Library | (505) 277-5441 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Cambridge Springs: Alliance College Library | (814) 398-2098 |
| | Philadelphia: Franklin Institute Library | (215) 448-1227 |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-8726 |
| South Carolina | Charleston: Medical University of South Carolina | (803) 792-2372 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 725-8876 |
| Texas | Austin: McKinney Engineering Library, University of Texas | (512) 471-1610 |
| | College Station: Sterling C. Evans Library, Texas A & M University | (409) 845-2551 |
| | Dallas Public Library | (214) 749-4176 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Utah | Salt Lake City: Marriott Library, University of Utah | (801) 581-8394 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**JAMES E. DENNY, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF September 1, 1984**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director | 6-25-82 |
| ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director | 9-29-82 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director | 12-09-82 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director | 6-19-80 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director | 6-18-74 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director | 2-23-84 |
| INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director | 12-14-81 |
| RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director | 10-13-82 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director | 5-09-80 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director | 7-06-81 |
| DESIGN, GROUP 290—K. L. CAGE, Director | 2-22-82 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant) | 3-12-82 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director | 5-18-82 |
| MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director | 6-08-82 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director | 11-30-81 |
| GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director | 6-04-82 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during September 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,339,206 to 3,344,432, inclusive

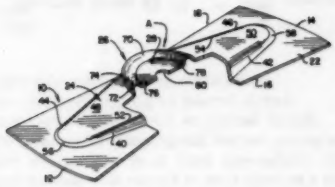
Plant Patents ..... Numbers 2,764 to 2,769 inclusive

# REEXAMINATIONS

## OCTOBER 30, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,037,418 (267th)**
**LOAD SUPPORTING BEARING PLATE**
**John I. Hannan, Shadyside, Ohio, assignor to Phillips Stamping Co., Inc., Bellaire, Ohio**
**Reexamination Request No. 90/000,224, Jul. 6, 1982.**
**Reexamination Certificate for Patent No. 4,037,418, issued Jul. 26, 1977, Ser. No. 685,695, May 12, 1976.**
**Int. Cl.[3] E21D *21/00***
**U.S. Cl. 405—259**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **32** is confirmed.

Claim **9** is cancelled.

Claims **1, 10, 22, 23, 25, 26, 27** and **31** is determined to be patentable as amended.

Claims **2–8, 11–21, 24** and **28–30**, dependent on an amended claim, are determined to be patentable.

**1**. A low profile bearing plate of the type adapted to provide support for a generally planar surface, said plate comprising:

a generally flat body having a length greater than the width with a longitudinal axis extending between the body ends and a transverse axis extending between the body sides with said axes intersecting at substantially the midpoint of said body, one face of said flat body defining a generally planar plate bearing surface adapted to be closely received against a generally planar surface; an elongated major embossed area extending outwardly from the other face of said body and being located so as to extend along said longitudinal axis over a major portion of the body length; the height of said major embossed area being such that said plate defines a relatively low profile; a recessed area extending inwardly from the outer surface of said major embossed area back toward said plate bearing surface and being coaxially disposed relative to the intersection of said body axes, said recessed area having a bottom wall disposed generally parallel to and spaced from said plate bearing surface; *a minor embossed area adjacent said major embossed area and said recessed area, a portion of said minor embossed area extending outwardly from said major embossed area top wall;* and, an opening in said bottom wall coaxially disposed with the intersection of said body axes adapted to receive headed fastener means for affixing said support plate to a generally planar surface; the depth of said recessed area being such that when said fastener means is received in said opening, at least a portion of the head of said fastener means is concealed within said recessed area.

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**B1 4,127,416 (268th)**
**METHOD OF PRODUCING A CERAMIC PRODUCT**
**Roland J. Lumby; Bernard North, both of Birmingham, and Alfred J. Taylor, West Midlands, all of England, assignors to Lucas Industries Limited, Birmingham, England**
**Reexamination Request No. 90/000,440, Aug. 31, 1983.**
**Reexamination Certificate for Patent No. 4,127,416, issued Nov. 28, 1978, Ser. No. 815,454, Jul. 13, 1977.**
**Claims priority, application United Kingdom, Jul. 24, 1976, 30985/76; Jul. 24, 1976, 30986/76; Feb. 21, 1977, 7187/77**
**Int. Cl.[3] C04B *35/50, 35/58***
**U.S. Cl. 501—98**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **6** is cancelled.

Claims **1, 2** and **9–12** are determined to be patentable as amended.

Claims **3, 4, 5, 7** and **8**, dependent on an amended claim, are determined to be patentable.

**1**. A method of producing a ceramic product, [comprising] *consisting essentially of* the steps of forming a powder mixture consisting essentially of a first component consisting of compounds containing the elements silicon, aluminum, oxygen and nitrogen *and excluding added silica other than as an impurity* in proportions such that the total number of silicon and aluminum atoms to the total number of oxygen and nitrogen atoms lies in the range 0.735 to 0.77 and such that said compounds react together during the subsequent sintering process to produce a single phase ceramic material obeying the general formula:

$$Si_{6-z}Al_zO_zN_{8-z}$$

where z is between 0.38 and [1.5] *1.1*, and between 0.1 and 10% by weight of a second component in the form of an oxide of at least one of the further elements, ytrrium, scandium, cerium, lanthanum and the metals of the lanthanide series; and sintering said mixture in a protective environment [with or] without the application of pressure at a temperature between 1600° C. and 2000° C. and for a time, decreasing with increasing temperature, of at least 10 minutes to at least 5 hours so as to produce a ceramic [material] *product* containing at least 80% by volume of said single phase ceramic material together with a second phase containing said at least one further element, which is a glass phase during sintering *and said second phase is selected from the group consisting of a glass phase or a crystalline phase having aluminum in the crystalline structure, or a combination thereof.*

**2**. A method as claimed in claim **1**, wherein the compounds of the first component consist of silicon nitride, aluminum nitride, alumina and silica, *as an inherent impurity on the silicon nitride,* with at least part of the [silica and] alumina being present as *an* inherent [impurities] *impurity* on the [silicon nitride and] aluminum nitride [respectively].

# DECLARATIONS

## OCTOBER 10, 1958

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 31,713
## ANTI-BACKLASH NUT ASSEMBLY


**Keith W. Erikson, 7 Quarry Circle Dr., Milford, N.H. 03055, and Kenneth W. Erikson, Peasley Rd., Merrimack, N.H. 03054**



**Original No. 4,353,264, dated Oct. 12, 1982, Ser. No. 189,333, Sep. 22, 1980. Application for reissue Jun. 8, 1983, Ser. No. 502,250**

**Int. Cl.³ F16H *57/12*; F16B *39/36***

**U.S. Cl. 74—441** **8 Claims**

1. An assembly, comprising in combination:

a. a first nut portion having an internal thread;

b. a second nut portion having an internal thread;

c. retaining means for retaining said first nut portion and said second nut portion in a fixed non-radially rotatable aligned position with respect to each other on a threaded screw; and,

d. spacer means between said first and second nut portions and rotatably mounted on said retaining means; and,

e. biasing means causing the spacer means to react to any slack between opposing nut portions and axially rotate against at least one surface of one nut portion.

4. An anti-backlash nut assembly of claim 1 wherein an elastomeric washer is provided intermediate the spacer means and the [retaining means] *said one surface of one nut portion.*

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## Re. 31,714
## PRE-WIRED TERMINAL CONNECTING BLOCK

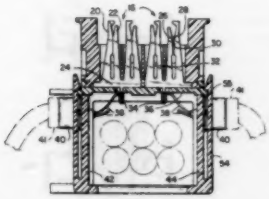

**Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.**



**Original No. 4,150,867, dated Apr. 24, 1979, Ser. No. 845,602, Oct. 26, 1977. Continuation-in-part of Ser. No. 507,972, Sep. 20, 1974, abandoned. Application for reissue Apr. 20, 1981, Ser. No. 255,441**

**Int. Cl.³ H01R *4/24***

**U.S. Cl. 339—97 P** **74 Claims**

1. A mounting bracket for terminal blocks the mounting bracket including:

an elongated rear portion having end panels and divider means between the end panels to define a plurality of openings in the rear portion to receive unitary connectors;

first and second spaced apart elongated side portions extending fom said rear portion and being generally perpendicular thereto;

each of said side portions having a plurality of recesses to receive unitary connectors;

*fastening means on said bracket for mounting at least one unitary connector to the bracket;*

said side portions terminating at an open front portion of the bracket and defining mounting surfaces for receiving a terminal block; and

mounting means for mounting the bracket on a support; and

flexible clamps adjacent each end of each side portion for releaseably retaining a terminal block on the bracket.

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## Re. 31,715
## LIQUID CRYSTAL COMPOUNDS


**David Coates, Bishops Stortford; George W. Gray, Cottingham, and Damien G. McDonnell, Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**



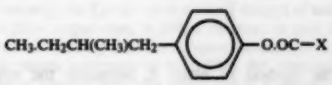
**Original No. 4,195,916, dated Apr. 1, 1980, Ser. No. 893,611, Apr. 5, 1978. Application for reissue Mar. 27, 1981, Ser. No. 248,458**

**Claims priority, application United Kingdom, Apr. 5, 1977, 14296/77**

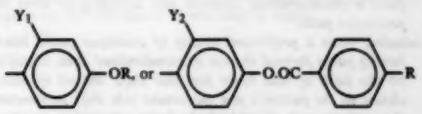
**Int. Cl.³ G02F *1/13*; C09K *3/34*; G01K *11/16*; C07C *69/74, 69/78, 69/63, 69/65, 69/90***

**U.S. Cl. 350—346** **32 Claims**


1. A liquid crystal compound which is an optically active ester having the formula:

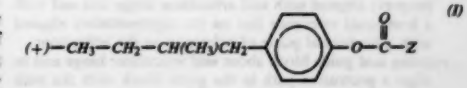


wherein X is



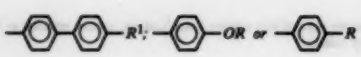
R is an alkyl group, which may be chiral, having less than 15 carbon atoms, $Y_1$ is halogen or methyl and $Y_2$ is halogen or methyl.

*13. A liquid crystal material which is a mixture of liquid crystal compounds, each of which exhibits a liquid crystal phase, at least one of said crystal liquid compounds being a chiral compound existing in a state in which it is not mixed with an equal amount of its optical isomer of opposite optical rotation, said chiral compound forming at least 5 % by weight of said material and having a molecular helical pitch of about 0.5 μm or less, said chiral compound being an ester having the formula (I):*



(I)

*where X is selected from the group consisting of:*



*where R is an alkyl group having less than 15 carbon atoms, and $R^1$ is an n-alkoxy or n-alkyl group having less than fifteen carbon atoms.*

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**Re. 31,716**

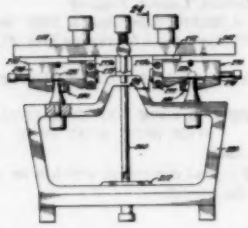
## DENTAL APPARATUS

**Robert L. Lee, 22937 Grand Terrace Rd., Colton, San Bernardino County, Calif. 92324**

**Original No. 4,034,475, dated Jul. 12, 1977, Ser. No. 581,203, May 27, 1975. Continuation-in-part of Ser. No. 485,158, Jul. 1, 1974,. Application for reissue Jun. 28, 1979, Ser. No. 52,966**

**Int. Cl.³ A61C *11/00***

**U.S. Cl. 433—56** **29 Claims**



**[2. The method of claim 1, including the steps of:]** *A method of simulating jaw movements comprising the steps of:*

*measuring or registering specified parameters of a patient's lower jaw movements including side shift of the lower jaw from a predetermined location and including at least one protrusive path;*

*selecting from a preformed supply of analogue guide blocks having paths formed therein of standardized sizes, classified on the basis of said lower jaw side shift, the set of blocks closest to the patient's jaw movement side shift parameters, the path in each of said blocks being adapted to receive a stylus on a dental articulator, said path having an upper wall, an inner or medial wall, and a rear wall adjacent a centric position point;*

*mounting the selected blocks in a dental articulator in a manner to receive the articulator styluses and to simulate the patient's jaw movements including rotating the blocks about the hinge axis of the articulator to the positions which will orient the guide block paths so that movement of the styluses within said block paths will best duplicate the patient's protrusive and side shift paths;*

positioning a representation of said protrusive path adjacent the outer side of a respective one of said set of selected guide blocks with the hinge axis of the representation properly aligned with said articulator hinge axis and with a horizontal reference line on the representation aligned with a horizontal plane of reference on the articulator;

rotating said guide block about said articulator hinge axis to align a protrusive path in the guide block with the path shown on said representation; and

fixing the guide block in this aligned position.

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**Re. 31,717**

## 2-CHLORO-3-(PHENOXY OR PHENYLTHIO)-6-NITRO-ANILINES

**Wolfgang Buck; Richard Sehring; Gerbert Linden, all of Ingelheim am Rhein, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany**

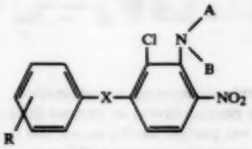
**Original No. 4,394,159, dated Jul. 19, 1983, Ser. No. 243,385, Mar. 13, 1981. Continuation of Ser. No. 185,799, Sep. 10, 1980, abandoned, which is a continuation of Ser. No. 127,367, Mar. 4, 1980, abandoned, which is a continuation of Ser. No. 57,500, Jul. 13, 1979, abandoned. Application for reissue Sep. 9, 1983, Ser. No. 530,633**

**Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831262**

**Int. Cl.³ E05B *63/14, 65/08;* C07C *149/42, 87/60***

**U.S. Cl. 71—98** **6 Claims**

1. A compound of the formula



wherein

A is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, chloro-(alkyl of 2 to 6 carbon atoms), hydroxy-(alkyl of 2 to 6 carbon atoms) or allyl;

B is *hydrogen or* alkyl of 1 to 3 carbon atoms;

R is hydrogen, fluorine, chlorine, bromine, methyl or methoxy; and

X is oxygen or sulfur.

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**Re. 31,718**

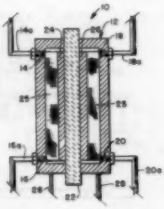
## ELECTROCHEMICAL SEPARATION AND CONCENTRATION OF HYDROGEN SULFIDE FROM GAS MIXTURES

**Jack Winnick, Atlanta, Ga.; Norman F. Sather, Naperville, and Hann S. Huang, Darian, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Original No. 4,246,081, dated Jan. 20, 1981, Ser. No. 17,064, Mar. 2, 1979. Division of Ser. No. 398,748, Jul. 16, 1982,. Application for reissue Jul. 16, 1982, Ser. No. 399,051**

**Int. Cl.³ C25F *1/00***

**U.S. Cl. 204—130** **2 Claims**



**1.** A method for removing **[**sulfur gases**]** *principally $H_2S$* from a gas mixture at a temperature of about 150° C. or above, said method comprising the steps of: providing an electrochemical cell having an inert cathode and an inert anode; providing said cell with i an electrolyte **[**which is molten at temperatures above about 150° C. selected from the group**]** comprising *an* alkali metal **[**sulfates, alkali metal bisulfates, and alkali metal pyrosulfates**]** *sulfide;* raising the temperature

of said cell to at least 150° C. whereby said electrolyte is in its molten state; effecting current flow between said cathode and said anode *by providing both an external source of electrical energy across said anode and cathode and passing a reducing gas past said anode;* directing said gas mixture past said cathode where [oxidation of sulfur occurs and sulfur containing] *S*— anions are formed which migrate toward said anode and are converted to gaseous species *or elemental sulfur,* whereby *hydrogen sulfide or elemental sulfur* [is evolved] *produced* at said anode.

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**Re. 31,719**

## SUPPORTED CATALYST FOR PURIFYING GAS AND METHOD OF MANUFACTURING THE SAME

**Kazunori Sonetaka, Hirakata; Atsushi Nishino, Neyagawa, and Kunio Kimura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Original No. 4,211,672, dated Jul. 8, 1980, Ser. No. 936,507, Aug. 24, 1978. Application for reissue Jun. 4, 1982, Ser. No. 384,966**

**Claims priority, application Japan, Aug. 26, 1977, 52-102971**

**Int. Cl.³ B01J** *21/12, 21/58, 23/78*

**U.S. Cl. 502—63** **7 Claims**

1. A catalyst for use in purification of a gas which comprises a catalyst carrier composed of alumina cement having a CaO component of less than 40% by weight, an $Al_2O_3$ component of more than 35% by weight and a $Fe_2O_3$ component of less than 20% by weight and at least one aggregate selected from the group consisting of silica aggregate, silica-alumina aggregate, and alumina aggregate, and a platinum group metal supported on said catalyst carrier in an amount of 0.001 to 0.1% by weight, said catalyst being produced by the steps comprising:

a. molding a molded body from a mixture comprising alumina cement and said aggregate;

b. curing said molded body for the hardening thereof,

c. subsequently *drying and/or* heat treating said hardened molded body [at a temperature range from 250° to 700° C.] to obtain a catalyst carrier; and

d. causing a platinum group metal to be supported on said catalyst carrier by steps comprising:

1. contacting said carrier with a solution of a salt of said platinum group metal to impregnate said solution on the surface of said carrier; and

2. subsequently heat treating said catalyst impregnated carrier at a temperature [below] *from 250° to* 700° C. to convert said platinum group metallic salt into a platinum group metal.

**Re. 31,720**

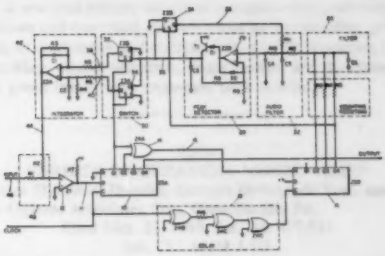
## DIGITAL ENCODING CIRCUITRY

**Richard E. DeFreitas, Westford, and John J. Blake, Pepperell, both of Mass., assignors to DeltaLab Research, Inc., Chelmsford, Mass.**

**Original No. 4,254,502, dated Mar. 3, 1981, Ser. No. 71,244, Aug. 30, 1979. Application for reissue Mar. 3, 1983, Ser. No. 472,264**

**Int. Cl.³ H03K** *13/22;* **H04L** *27/02*

**U.S. Cl. 375—30** **27 Claims**



1. In an electrical system of the type in which a digitally-encoded signal with high and low states is determined at least in part by the difference between a present value of an input signal and a reconstructed signal representative of a past value of said input signal and [including signal generating means responsive to a reference signal determined from the output of said peak detection means for generating said reconstructed] *in which the occurence of a high or a low state in said digitally-encoded signal corresponds to an incremental change in said input signal of an amount dependent upon a reference signal determined from said digitally-encoded* signal, improved circuitry for generating said [reconstructed] *reference* signal, comprising a filter for extracting from the digital signal information relating to the time derivative of said input signal, [peak] detection means for determining the [peak value of the] output of said filter *so that said filter output rises, to follow increases in said derivative, and decays more slowly than it rises upon decreases in said derivative,* and means upstream of said filter for responding to a repetition of two or more low states and to a repetition of two or more high states in said digital signal, said filter responding to the output of said upstream means, thereby making said filter and said *reference* signal [generating means] sensitive to repetition of both states of said digital signal.

# PLANT PATENTS

## GRANTED OCTOBER 30, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**5,306**

**MINIATURE ROSE PLANT 'BIT O' GOLD'**

**Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208**

**Filed May 10, 1982, Ser. No. 376,919**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—8** **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy; dwarf; bushy; rounded; much branched habit, substantially as illustrated and described, characterized by buds and flowers of a rich gold yellow color, being of a shade (or range) generally near Cadmium Orange 8/2 to Saffron Yellow 7/2 (or similar), the buds and flowers resembling the variety Gold Coin (U.S. Plant Pat. No. 2,921) in form and size; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose cluster.

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**5,307**

**PLUM TREE (35-EA-220)**

**Chris F. Zaiger, 1907 Elm Ave.; Gary N. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351**

**Filed Mar. 7, 1983, Ser. No. 472,982**
**Int. Cl.³ A01H** *5/03*
**U.S. Cl. Plt.—38** **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by late ripening, large size, semi-freestone, globose fruit slightly flattened at the stem end, the fruit having bluish-red skin and firm, yellow flesh; and further characterized by fruit which holds well in cold storage, is of good eating quality and very good keeping and long distance shipping quality, and—in comparison to the Roysum—ripens approximately ten days earlier and with fewer and smaller skin cracks along the suture near the stem cavity.

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**5,308**

**APRICOT TREE (48-G-472)**

**Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351**

**Filed Mar. 7, 1983, Ser. No. 472,628**
**Int. Cl.³ A01H** *5/03*
**U.S. Cl. Plt.—39** **1 Claim**

1. A new and distinct variety of apricot tree, substantially as illustrated and described, characterized, in particular, by fruit which is larger, and more uniform in ripening and distribution throughout the tree in comparison to the Flaming Gold; by more consistent bearing with greater production of fruit in comparison to the King Cot; and by fruit which is of good fresh-fruit eating quality, good storage quality, ships well to long distance markets, and maintains excellent color and flavor when processed as dried fruit.

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**5,309**

**AVOCADO TREE—"ESTHER"**

**Robert H. Whitsell, Riverside, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Feb. 18, 1983, Ser. No. 467,716**
**Int. Cl.³ A01H** *5/03*
**U.S. Cl. Plt.—44** **1 Claim**

1. The new and distinct variety of avocado tree herein described and illustrated and identified by the characteristics enumerated above.

**5,310**

**GERANIUM 'FIREWORKS'**

**Charles F. Heidgen, 821 Walnut St., Batavia, Ill. 60510**

**Filed Jan. 3, 1983, Ser. No. 442,654**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described, characterized by its cascading growth habit; its continuous and exceptionally prolific blooming habit; its striking, almost primitive, single flower; and its distinctive dark green leaves with extremely dark zonation.

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**5,311**

**VARIETY OF GERANIUM NAMED 'ALEX'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,922**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as herein shown and described.

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**5,312**

**VARIETY OF GERANIUM NAMED 'PERLENKETTE'**

**Guenter Hoffmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,944**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as herein shown and described.

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**5,313**

**VARIETY OF GERANIUM NAMED 'LACHSBALL'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,965**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as herein shown and described.

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**5,314**

**VARIETY OF GERANIUM NAMED 'JUBILAEUM'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 478,144**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as shown and described.

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**5,315**

**VARIETY OF GERANIUM NAMED 'PALAIS'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 478,145**
**Int. Cl. A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as herein shown and described.

# PLANT PATENTS

## GRANTED OCTOBER 30, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**5,306**

**MINIATURE ROSE PLANT 'BIT O' GOLD'**

**Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208**

**Filed May 10, 1982, Ser. No. 376,919**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—8** **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy; dwarf; bushy; rounded; much branched habit, substantially as illustrated and described, characterized by buds and flowers of a rich gold yellow color, being of a shade (or range) generally near Cadmium Orange 8/2 to Saffron Yellow 7/2 (or similar), the buds and flowers resembling the variety Gold Coin (U.S. Plant Pat. No. 2,921) in form and size; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose cluster.

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**5,307**

**PLUM TREE (35-EA-220)**

**Chris F. Zaiger, 1907 Elm Ave.; Gary N. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351**

**Filed Mar. 7, 1983, Ser. No. 472,982**

**Int. Cl.³ A01H *5/03***

**U.S. Cl. Plt.—38** **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by late ripening, large size, semi-freestone, globose fruit slightly flattened at the stem end, the fruit having bluish-red skin and firm, yellow flesh; and further characterized by fruit which holds well in cold storage, is of good eating quality and very good keeping and long distance shipping quality, and—in comparison to the Roysum—ripens approximately ten days earlier and with fewer and smaller skin cracks along the suture near the stem cavity.

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**5,308**

**APRICOT TREE (48-G-472)**

**Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351**

**Filed Mar. 7, 1983, Ser. No. 472,628**

**Int. Cl.³ A01H *5/03***

**U.S. Cl. Plt.—39** **1 Claim**

1. A new and distinct variety of apricot tree, substantially as illustrated and described, characterized, in particular, by fruit which is larger, and more uniform in ripening and distribution throughout the tree in comparison to the Flaming Gold; by more consistent bearing with greater production of fruit in comparison to the King Cot; and by fruit which is of good fresh-fruit eating quality, good storage quality, ships well to long distance markets, and maintains excellent color and flavor when processed as dried fruit.

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**5,309**

**AVOCADO TREE—"ESTHER"**

**Robert H. Whitsell, Riverside, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Feb. 18, 1983, Ser. No. 467,716**

**Int. Cl.³ A01H *5/03***

**U.S. Cl. Plt.—44** **1 Claim**

1. The new and distinct variety of avocado tree herein described and illustrated and identified by the characteristics enumerated above.

**5,310**

**GERANIUM 'FIREWORKS'**

**Charles F. Heidgen, 821 Walnut St., Batavia, Ill. 60510**

**Filed Jan. 3, 1983, Ser. No. 442,654**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described, characterized by its cascading growth habit; its continuous and exceptionally prolific blooming habit; its striking, almost primitive, single flower; and its distinctive dark green leaves with extremely dark zonation.

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**5,311**

**VARIETY OF GERANIUM NAMED 'ALEX'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,922**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as herein shown and described.

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**5,312**

**VARIETY OF GERANIUM NAMED 'PERLENKETTE'**

**Guenter Hoffmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,944**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant, substantially as herein shown and described.

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**5,313**

**VARIETY OF GERANIUM NAMED 'LACHSBALL'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 477,965**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as herein shown and described.

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**5,314**

**VARIETY OF GERANIUM NAMED 'JUBILAEUM'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 478,144**

**Int. Cl.³ A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as shown and described.

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**5,315**

**VARIETY OF GERANIUM NAMED 'PALAIS'**

**Guenter Hofmann, Dresden, German Democratic Rep., assignor to Oglevee Associates, Inc., Connellsville, Pa.**

**Filed Mar. 23, 1983, Ser. No. 478,145**

**Int. Cl. A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of geranium plant substantially as herein shown and described.

5,316

## ASPARAGUS PLANT—M138

Frank H. Takatori, and Franklin D. Souther, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 18, 1983, Ser. No. 467,729
Int. Cl.[3] A01H 5/03
U.S. Cl. Plt.—89 1 Claim

1. The new and distinct variety of asparagus plant herein described and illustrated and identified by the characteristics enumerated above.

5,317

## ASPARAGUS PLANT—F189

Frank H. Takatori, and Franklin D. Souther, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 18, 1983, Ser. No. 468,015
Int. Cl.[3] A01H 5/12
U.S. Cl. Plt.—89 1 Claim

1. The new and distinct variety of asparagus plant herein described and illustrated and identified by the characteristics enumerated above.

# PATENTS

## GRANTED OCT. 30, 1984

### ERRATA

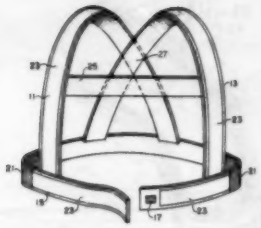
| For CLASS | See PATENT NO. |
|---|---|
| 128–330 | 4,479,291 |
| 446–427 | 4,479,327 |
| 446–237 | 4,479,328 |
| 446–175 | 4,479,329 |
| 132–084 | 4,479,516 |
| 157–001 | 4,479,522 |
| 251–328 | 4,479,670 |
| 384–475 | 4,479,682 |
| 384–619 | 4,479,683 |
| 418–144 | 4,479,763 |
| 346–208 | 4,480,052 |
| 546–114 | 4,480,098 |
| 546–164 | 4,480,099 |
| 546–307 | 4,480,100 |
| 548–478 | 4,480,112 |
| 346–135 | 4,480,302 |
| 371–020 | 4,480,329 |

# PATENTS

## GRANTED OCTOBER 30, 1984

## GENERAL AND MECHANICAL

**4,479,267**
**SAFETY HARNESS**
**Peter Radowsky, Jr., 1879 Saunders Settlement Rd., Niagara Falls, N.Y. 14304**
**Filed Mar. 7, 1983, Ser. No. 473,069**
**Int. Cl.³ A41D *13/00*; A61F *5/02*; A61D *19/00***
**U.S. Cl. 2—2** **5 Claims**



1. A safety harness having a front and a back portion comprised of
(a) a belt
(b) a belt fastening means adapted to secure said belt around a wearer's waist, said belt having elastic portions positioned in the sides thereof,
(c) a pair of shoulder straps spacedly secured to said belt at said front and back portions of said harness, said shoulder straps singly crossing in the back of said harness in a free manner,
(d) a reflective surface on the outer portions of said belt and said shoulder straps.

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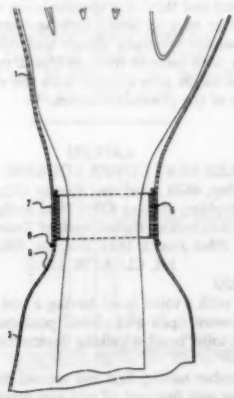
**4,479,268**
**SPORTMAN'S WATERPROOF SUIT**
**Anthony A. C. Tillbrook, Hillair, Coopersale La., Theydon Garnon, Epping, Essex, England**
**Filed May 24, 1982, Ser. No. 381,559**
**Claims priority, application United Kingdom, May 27, 1981, 8116154**
**Int. Cl.³ A62B *17/00***
**U.S. Cl. 2—2.1 R** **4 Claims**



1. A sportsman's waterproof suit having a hand or foot cover manufactured in a thin and flexible waterproof synthetic material and having a seal at the wrist or ankle for sealing against a wrist or ankle seal of the waterproof suit to prevent ingress of water at the wrist or ankle, and spacing means in the form of a substantially rigid cylindrical spacer fitted separately from the cover and suit, and over which both the cover seal and the suit wrist or ankle seal are stretched, the spacing means providing an air passage around the wearer's wrist or ankle to allow air from within the suit to pass into the cover, the wrist or ankle seal of the suit being located directly over the spacing means, and the wrist or ankle seal of the hand or foot cover being located over the spacing means and outside the seal of the suit, the hand or foot cover seal being formed at a terminal area of a zone of reducing diameter of the cover.

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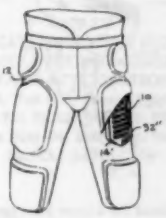
**4,479,269**
**ATHLETIC PADDING**
**Karl E. Balliet, Bedford, Va., assignor to Rubatex Corporation, Bedford, Va.**
**Filed Dec. 9, 1982, Ser. No. 448,509**
**Int. Cl.³ A41D *13/00***
**U.S. Cl. 2—23** **15 Claims**



6. A shock absorbing pad formed of first and second constituent components respectively comprising materials of different hardness and each including a plurality of parallel elements extending from a common base element of each constituent component wherein said elements of each of the different constituent components are interleaved with the elements of the other constituent component.

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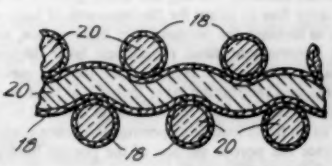
**4,479,270**
**INSULATED CLOTHING AND OTHER LIKE FABRIC PRODUCTS**
**William Novinger, 322 W. 57th St., Suite 48E, New York, N.Y. 10019**
**Filed Oct. 13, 1981, Ser. No. 310,639**
**Int. Cl.³ A41B *1/12*; D02G *3/00***
**U.S. Cl. 2—69** **7 Claims**




1. A thermal insulating product comprising a plurality of elongated hollow elements; each of said elongated hollow elements being in the form of long thin tubes fabricated from a flexible fabric material; each of said long thin tubes having a longitudinal seam internally disposed so that the raw edges of

said fabric material project into said elongated hollow elements; said long thin tubes being filled with a mixture of one or more soft insulating materials selected from the group consisting of down, cotton, cork, foam, polyfill and other like natural or synthetic materials; and said elongated hollow elements being woven into an insulating fabric structure pattern forming a cloth adapted to be used for making insulated clothing or like products.

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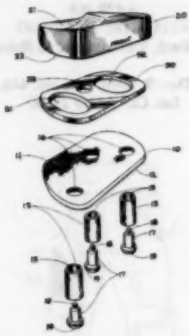
**4,479,271**

**PROSTHETIC DEVICE ADAPTED TO PROMOTE BONE/TISSUE INGROWTH**

**Richard C. Bolesky; Gene M. Farling, and Barry L. Gold, all of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.**

**Filed Oct. 26, 1981, Ser. No. 314,808**
**Int. Cl.³ A61F *1/04, 5/04***
**U.S. Cl. 3—1.911** **14 Claims**



1. A tibial component for a knee joint prosthesis comprising:

(a) a bottom base layer of a porous metal material having an upper base surface, and a lower base surface, defining a thickness of porous material therebetween, said lower base surface adapted to be in direct contact with a prepared bone surface to promote the ingrowth of bone and/or tissue into the porous material, and

(b) a top non-metal layer molded onto the upper base surface of the bottom base layer and wherein said non-metal layer has an upper non-metal surface and a lower non-metal surface, wherein said upper non-metal surface is contoured appropriately for use as an articulating bearing surface, and wherein at least a portion of the lower non-metal surface is in direct contact with the upper base surface wherein said portion of the non-metal layer in contact with the upper base surface penetrates into the porous metal of the upper base surface to secure said non-metal layer to the porous base layer, said non-metal material penetrating only partially through the thickness of porous material, leaving the lower portion of the porous layer free to allow for the ingrowth of bone and/or tissue in through the porous lower base surface, and

(c) and intermediate metal reinforcing layer disposed between the bottom base layer and the top non-metal layer wherein said reinforcing layer includes at least one opening, therefore allowing the non-metal material to the top layer to fill the at least one opening, and hence contact and penetrate the porous surface of the porous bottom base layer at the opening, and

(d) at least one porous metal stem protruding from the lower base surface of the bottom base layer, wherein said outer surface of the protruding stems is adapted to be in direct contact with the prepared bone surface to promote the ingrowth of bone and/or tissue, and wherein each protruding porous metal stem includes a bore therethrough which extends from the distal end of the stem through to the upper surface of the bottom base layer.

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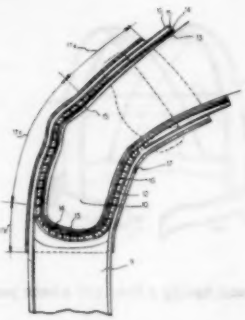
**4,479,272**

**PROSTHESIS RETAINER**

**David Beldzisky, 191 Rue Saint Charles, 75015 Paris, France**

**Filed Jan. 31, 1983, Ser. No. 462,371**
**Claims priority, application France, Feb. 5, 1982, 82 01855**
**Int. Cl.³ A61F *1/08, 1/02, 1/14***
**U.S. Cl. 3—16** **6 Claims**



1. An arrangement for the epidermal or protection of an amputated limb, e.g., a lower limb, and for retention of the protected member relative to a prosthesis, the arrangement comprising in combination:

a first fine contact sheath for epidermal protection associated with a stump covering bonnet, e.g. of wool,

a second bonnet covering fine sheath having a low coefficient of friction and in internal contact with a sleeve affixable to the prosthesis,

a third fine sheath having a low coefficient of friction covering the bonnet and in contact with the socket of the prosthesis,

a prosthesis retaining sheath of elastic material open at both ends, covering the prosthesis and having in the vicinity of its two open ends respectively an upper and lower elastic retention portion, and an intermediate middle portion partially covering the corresponding upper portions of the fine contact sheath, the bonnet, the bonnet covering fine sheath and the sleeve covering fine sheath,

the respective lengths of the first sheath and bonnet, and of the second and third fine sheaths being such that they are folded over once by simple turning over the upper end of the prosthesis retaining sheath and then a second time together with same to form an elastic retaining welt, one of whose edges is in contact with the edge of the upper aperture of the prosthesis socket.

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**4,479,273**

**TOILET SEAT COVER LOCKING DEVICE**

**David T. Raden, 6821 Edgevale, Kansas City, Mo. 64113, and Jack E. Hopkins, Kansas City, Mo., assignors to David T. Raden and Gayle Kim Raden, both of Kansas City, Mo.**

**Filed Jun. 3, 1983, Ser. No. 500,879**
**Int. Cl.³ A47K *13/00***
**U.S. Cl. 4—253** **22 Claims**

1. For use with a toilet bowl having a seat member with lid rotatable between open and closed positions for controlling access to said toilet bowl, a locking device for said lid comprising:

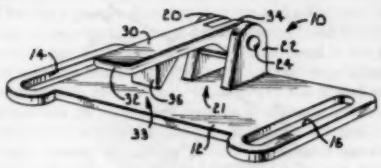
an arm member having first and second displaced ends;

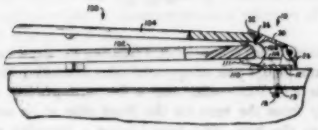
structure on said first end of said arm member for engaging a portion of said lid;

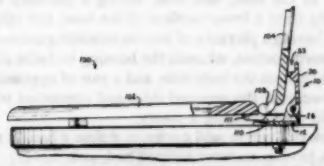
means for mounting said second end of said arm member in rotation about an axis passing therethrough; and

means for locating said structure at a position adjacent said portion of said lid for said engagement upon an initial rotation of said lid towards said open position, said engagement urging said arm with said structure thereon in rotation about said axis contra said rotation of said lid to resist subsequent lid rotation towards said open position.

12. For use with a toilet bowl having a seat member with lid rotatable about a generally horizontal axis between open and closed positions for controlling access to said toilet bowl, a locking device for said lid comprising:





an arm member having first and second displaced ends;

wedge means on said first end of said arm member for engaging a portion of said lid; and

means for locating said wedge means at a position rearwardly adjacent said portion of said lid and forward of said horizontal axis for engaging said lid portion upon an initial rotation of said lid towards said open position, said engagement resisting subsequent rotation of said lid about said horizontal axis and subsequent movement of the same towards said open position.

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**4,479,274**

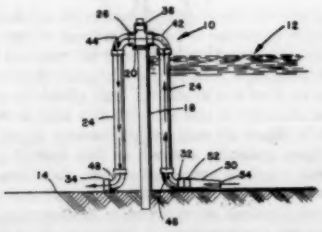
**SWIMMING POOL SIPHON**

**Robert Biby, 421 Arrowhead, Troy, Ill. 62294**

**Filed Jun. 30, 1982, Ser. No. 393,667**

**Int. Cl.³ E04H 3/18**

**U.S. Cl. 4—496** **5 Claims**




1. A swimming pool siphon for above the ground swimming pools having a side wall extending above the pool floor and a pool ground support, said pool siphon comprising a bifurcated siphon having two tubular legs acting as a pool leg and a drain leg connected at a bight portion, said bight portion being comprised of a tee junction connected at opposite sides to tubular elbows, each of said elbows being connected to one of said legs, said bight portion having a width exceeding the width of said side wall of the pool and receivable on a top edge of said wall in a rest support position to provide a close straddling-relation of said elbows over said wall, said pool leg having a length at least equal to the height of the side wall so as to be supportable upon the floor of the pool, said drain leg having an outlet extending parallel to the ground whereby the outlet flow may be horizontal and parallel to the ground support, closure means for end portions of each of said legs and removable cap means for said bight portion to provide for filling said pool siphon with water, said closure means being operable to open the legs upon filling of the pool siphon to establish a siphon flow to drain water from said pool, said legs with the bight portion forming a substantially U-shaped construction and being substantially parallel to one another and having a length exceeding the distance between a top edge of the side wall and the pool floor and ground level to provide a three point contact of the pool siphon established by the resting of the bight portion upon the top edge of the side wall, the resting of the outlet end of the pool leg upon the pool floor and the outlet end of the drain leg upon the ground.

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**4,479,275**

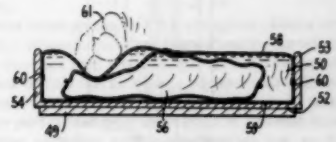
**WATERBED MATTRESS WITH FUNCTIONALLY NONREDUNDANT INNER BLADDER MEANS FOR WAVE ATTENUATION**

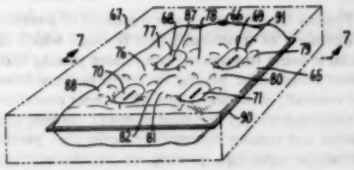
**Richard Fraige, P.O. Box 649, Carson City, Nev. 89701**

**Continuation of Ser. No. 96,427, Nov. 21, 1979, abandoned. This application May 24, 1982, Ser. No. 381,647**

**Int. Cl.³ A47C 27/08**

**U.S. Cl. 5—450** **19 Claims**




1. An improved waterbed mattress with provision for wave absorption, said mattress comprising:

an outer water-fillable bag-like enclosure having a longitudinal dimension and a lateral dimension, and having water-filling means particularly adapted for introducing water into the enclosure after manufacture of the mattress is complete;

at least one bladder disposed within said outer enclosure and filled or partially filled with liquid, and having liquid-filling means particularly adapted for use in:

filling or partially filling the bladder with liquid after manufacture of the mattress is complete, and

draining liquid from the bladder when the mattress is to be moved;

said bladder being substantially smaller in longitudinal and lateral extent than the enclosure; and

means for preventing collapse of the bladder and twisting of the bladder around its liquid-filling means during draining, said means comprising a quantity of fibrous material disposed within said bladder; and

the mattress and the liquid-containing bladder therein are not necessarily full or partially full of liquid at the time of sale, the filling or partial filling of the mattress and bladder with liquid instead possibly occurring thereafter.

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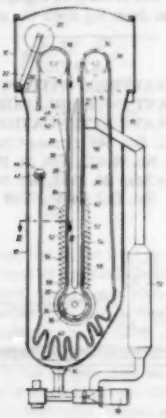
**4,479,276**

## PROCESS FOR CONTINUOUS WET TREATMENT OF TEXTILE MATERIALS

**Paul Ziegler, Franz/Höflerstrasse 2, I-39011 Lana (Bozen), Italy**

**Filed Aug. 10, 1981, Ser. No. 291,702**
**Int. Cl.³ D06B 5/04**
**U.S. Cl. 8—152** **7 Claims**



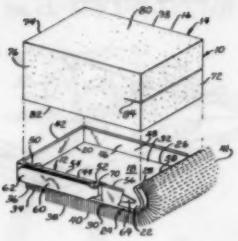
1. Process for continuous wet treatment of a textile material in a container of treatment liquid through which the textile material is being transported comprising passing textile material over a feed roller, passing the textile material from the feed roller vertically downward through an inner container, passing the textile material by openings in lower portions of the inner container and passing the textile material over parallel rollers adjacent the openings, passing the textile material around roller means within a bottom of the inner container and passing the textile material upward through the inner container, passing the textile material outward from the inner container and around a drive roller and driving the drive roller and the textile material, passing the textile material downward from the drive roller through an outer container surrounding the inner container, accumulating the textile material in a bottom of the outer container and passing the textile material upward through the outer container and outward through an opening in the outer container, flowing treatment liquid from the inner container through the textile material and through openings in lower portions of the inner container and adjacent parallel rollers into the outer container and over the textile material accumulated in the bottom of the outer container, and flowing treatment liquid from an overflow in an outer wall of the inner container near the feed roller into the outer container.

**4,479,277**

## SCRUB BRUSH

**Thomas Gilman, Woodstock, Ill., and Frank N. Miller, Racine, Wis., assignors to The Kendall Company, Boston, Mass.**

**Division of Ser. No. 324,748, Nov. 25, 1981, Pat. No. 4,420,853.**
**This application May 11, 1983, Ser. No. 478,752**
**Int. Cl.³ A46B 9/00**
**U.S. Cl. 15—111** **2 Claims**



1. A scrub brush comprising, a housing having a base, a back side, a front side, a pair of opposed sides extending between the back side and front side, and a forward portion extending upwardly from the base on the front side at an acute angle relative to the base, said base having a plurality of bristles extending from a lower surface of the base, and said forward portion having a plurality of bristles extending outwardly from the forward portion, wherein the housing includes an upstanding back wall on the back side, and a pair of opposed upstanding sidewalls on the opposed sides and connected to the back wall, said walls defining a cavity;

a block of foam in said cavity to define a handle member;

a pick having an outer tapered end; and

means for mounting the pick on one of the walls for movement between a first storage position and a second operative position with said outer end exposed.

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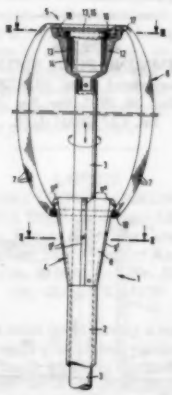
**4,479,278**

## SCRUBBING MEANS

**Ahti Heinonen, SF 25760 Tolja, Finland**

**Filed Feb. 24, 1982, Ser. No. 351,857**
**Int. Cl.³ A47L 13/142, 13/20**
**U.S. Cl. 15—120 A** **4 Claims**



1. A scrubbing apparatus comprising an inner shaft, a tubular member disposed around the shaft and movable longitudinally and rotatable with respect to the shaft, a mop composed of a

plurality of strands, a first head connecting one end of the mop to the inner shaft, a second head non-rotatably secured to the outer tubular member, said second head having a tapered outer surface that increases in diameter in a direction toward said first head, said second head having a large diameter end and a small diameter end, at least one longitudinally extending rib on the outer surface of said second head, an annular tie member connected to the opposite end of the mop and disposed around said second head, said strands extending between said tie member and said second head, the large diameter end of said second head having a greater diameter than the inner diameter of said annular tie member to prevent displacement of said tie member from the large diameter end of said second head in the direction of said first head, said opposite end of said mop being held between said tie member and the outer surface of said second head and said rib preventing rotation of the mop with respect to said second head said first head including a seat and a locking body having an annular shoulder, a second annular tie member connecting the first end of the mop to said shoulder, said second annular tie member being retained between said seat and said shoulder to thereby prevent rotation of the mop with reference to said seat.

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**4,479,279**

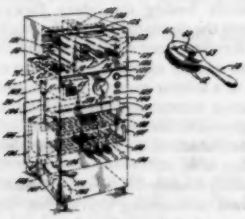
## BRUSH FOR AUTOMATIC BRUSH CLEANING APPARATUS

**Robert W. Schroeder, Bensenville, Ill., assignor to RoMark Technology, Inc., Itasca, Ill.**

**Division of Ser. No. 341,272, Jan. 21, 1982, Pat. No. 4,403,364. This application Aug. 19, 1983, Ser. No. 524,858**

**Int. Cl.³ A46B** *15/00, 17/00*

**U.S. Cl. 15—159 R** **3 Claims**



1. A brush for use in an automatic brush cleaning apparatus having a carrier member adapted to releasably receive, support, and transport the brush through sequential cleaning stations, said brush comprising a rigid back, a plurality of bristles projecting outwardly from one side of said back, an elongated support block rigid with the other side of said back, said block having a length substantially less than the length of said back and being formed with an aperture extending longitudinally through said block, and said aperature having a non-circular cross section for removably receiving a complementally shaped carrier member of the automatic apparatus for enabling said brush to be supported in predetermined relation to the carrier member as an incident to positioning of said carrier member into said aperture and be transported by the carrier member without relative rotational slippage therebetween.

**4,479,280**

## MAT BASE PLATE

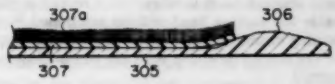
**Ken Yamazaki, Kobe; Yosuke Yamamoto, Toyonaka; Takehisa Kinoyama, Muko, and Kinichi Sasagawa, Takatsuki, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 1, 1980, Ser. No. 211,950**

**Claims priority, application Japan, Dec. 24, 1979, 54-178956; Dec. 24, 1979, 54-178957; Dec. 24, 1979, 54-178958; Dec. 24, 1979, 54-178959**

**Int. Cl.³ A47L** *23/22;* **B32B** *3/02*

**U.S. Cl. 15—217** **2 Claims**




1. For use in conjunction with a generally rectangular rug-like door mat made of a material which upon being repeatedly washed undergoes shrinkage in perimeter so as to become shorter and narrower than it had originally been,

a door mat base plate of non-shrinkable material made of rubber or resin, comprising:

a generally flat plate portion having an upwardly-presented floor; and

a rim perimetrically surrounding said flat plate portion, said rim having an apical plateau lying above said floor;

said rim further including an inner slope portion extending downwardly and inwardly from said apical plateau to said floor and an outer slope portion extending downwardly and outwardly from said apical plateau;

the inner slope portion, the apical plateau and the outer slope portion collectively providing a generally cylindrically curved rough profile in vertical transverse cross-section;

said profile being constituted by a rough surface having the appearance of a plurality of wave-like convexes and concaves;

said inner slope portion but not said apical plateau extending further inwards than the original length and width of the rug-like door mat, so that when the door mat is originally placed on said mat base plate, the door mat will be framed by said apical plateau and, depending on its size, by an outer part of said inner slope portion, and said inner slope portion extending sufficiently inwards that as the door mat shrinks in length and width as the door mat is repeatedly washed, the door mat becomes framed by and increasing proportion of the inner slope portion but the inner extent of the inner slope portion remains hidden by the mat.

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**4,479,281**

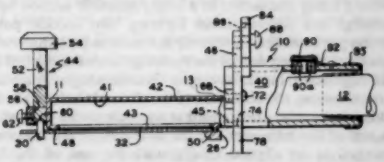
## METHOD AND APPARATUS FOR CLEANING PHONOGRAPH RECORDS

**Michael J. Mikutowski, 338 24th Ave. NE, Minneapolis, Minn. 55418**

**Filed Jan. 24, 1983, Ser. No. 460,670**

**Int. Cl.³ A47L** *5/36, 9/02*

**U.S. Cl. 15—303** **11 Claims**



5. A record cleaning attachment for a household vacuum cleaner to be used with an automatic or manual record player,

said attachment comprising a suction head and having an adapter at its outer end and a normally horizontally disposed vacuum slot at its inner end below the elevation of the adapter for positioning in close proximity to the record on the record player, a spindle connecting means at the inner end of the suction head to connect the suction head to the spindle of the record player, air sealing means at the adapter to permit the vacuum cleaner to be connected thereto in airtight relationship whereby the vacuum developed by the vacuum cleaner can be communicated through the suction head to the vacuum slot and a support leg means at the outer end of the suction head adapted to extend downwardly therefrom to a top wall of the record player to hold the suction head at a predetermined distance above it so that whenever a record is placed on the turntable the suction head will be positioned by the spindle connecting means and the support leg means a proper distance above the record turntable with the slot in close proximity to the record.

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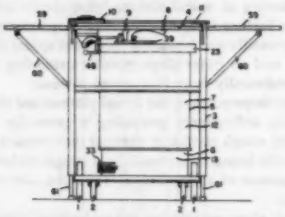
**4,479,282**

## CLEANING TROLLEY

**Bengt O. Hallström, Bränninge Gård, S-151 39 Södertälje, Sweden**

**Filed Dec. 8, 1982, Ser. No. 447,756**
**Claims priority, application Sweden, Apr. 23, 1982, 8202557**
**Int. Cl.³ A47L *5/38***
**U.S. Cl. 15—311** **3 Claims**



1. A cleaning trolley comprising a stand movable on wheels, provided with a table in which is arranged a vibrating suction box, and two extension leaves hingedly arranged opposite each other on the stand and cooperating with said table, the suction box being provided with a regulating block movable along a guide member and provided with a throughhole for the guide member, in order to regulate the operating length of the suction box, said stand carrying a vacuum cleaning unit located under the table and comprising a container for collecting dust and scrap particles from a flow of suction air being drawn in and a suction assembly located below the container and connected thereto, the container being closed by a lid with an inlet for said flow of suction air, while the suction assembly is provided with an outlet to blow out the flow of suction air; said lid being provided with a disc-shaped switching means for the suction path, which is pivotably journalled about a vertical axis and which has two openings spaced at a predetermined distance from each other and equidistant from the axis, for alignment with the inlet of the lid, one of the openings being connected to the suction box via a suction tube and the other opening being connected to a freely movable suction tube, the openings and suction tubes forming two suction paths for arbitrary connection by turning the suction-path disc-switch to a position aligning one of the openings with the inlet of the lid; said regulating block having a flexible tongue formed by a vertical recess, the hole-part of the through-hole in the tongue having its central axis located at an angle to the central axis of the rest of the hole-part and the hole-part of the tongue being arranged to be aligned axially with the rest of the hole to enable displacement of the regulating block along the guide member, the tongue being locked to the guide member by means of its inherent spring force; and a combined air cleaning and distributing means being arranged on the vacuum cleaning unit opposite the outlet, to further clean the air flowing out and to distribute the air flow to the sides and obliquely forwards, said means including a holder open on all sides, and a porous body exchangably arranged therein to clean and distribute the air.

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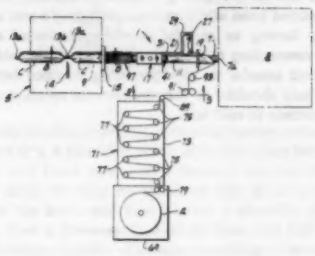
**4,479,283**

## METHOD OF AND APPARATUS FOR STUFFING FOODSTUFF INTO A CASING

**William C. Hollingsworth, Sheboygan, Wis., assignor to H-Worth, Inc., Sheboygan, Wis.**

**Filed Jan. 18, 1982, Ser. No. 339,996**
**Int. Cl.³ A22C *13/02*; B65B *43/42*, *9/06***
**U.S. Cl. 17—49** **14 Claims**



1. The method of stuffing sausage meat, which is to be smoked, into a casing of material suitable for the smoking of the sausage meat, comprising:

continuously feeding forward a continuous web of casing material from a supply thereof toward a stuffing tube extending horizontally forward from an extruder for forcing sausage meat through the tube from one end thereof to exit from its other end constituting its discharge end;

continuously forming the web of casing material into continuous tubing surrounding the stuffing tube with the side margins of the web brought together in inside face to inside face relation extending outwardly with respect to the stuffing tube;

continously feeding the tubing forward in the direction toward the discharge end of the stuffing tube and, as it is fed forward, continously stitching the side margins together as they extend outwardly to complete the formation of a tubular casing with a longitudinal sewn seam;

the casing surrounding the stuffing tube and extending lengthwise with respect to the stuffing tube with said seam on the outside of the casing throughout the length of the stuffing tube;

continously feeding the casing with said seam on the outside forward surrounding the stuffing tube toward the discharge end of the stuffing tube;

shirring the casing surrounding the stuffing tube to provide a supply of shirred casing surrounding the stuffing tube, the casing extending off the discharge end of the stuffing tube;

closing the casing downstream from the downstream end of the stuffing tube thereby providing a leading end closure for a unit length of the casing;

intermittently forcing sausage meat through the stuffing tube out of its discharge end and into the casing, the sausage meat entering the casing acting to draw the casing forward from the shirred supply off the discharge end of the stuffing tube to provide a unit length of the casing in which the sausage meat is stuffed;

closing the casing at the trailing end of the unit length to provide a trailing end closure for the unit length;

again closing the casing at a point upstream form the said

trailing end closure to provide a leading end closure for the next unit length; and

repeating the closing and sausage meat forcing steps.

6. Apparatus for stuffing sausage meat, which is to be smoked, into a casing of material suitable for the smoking of the sausage meat comprising:

means for feeding forward a continuous web of casing material from a supply thereof toward a stuffing tube extending horizontally forward from an extruder for forcing sausage meat through the tube from one end thereof to exit from its other end constituting its discharge end, with the web traveling continuously toward the stuffing tube;

means for continuously forming the web of casing material into continuous tubing surrounding the stuffing tube with the side margins of the web brought together in inside face to inside face relation extending outwardly with respect to the stuffing tube;

means for continuously feeding the tubing forward in the direction toward the discharge end of the stuffing tube and, as it is fed forward, continuously stitching the side margins together as they extend outwardly to complete the formation of a tubular casing with a longitudinal sewn seam;

the casing surrounding the stuffing tube and extending lengthwise with respect to the stuffing tube with said seam on the outside of the casing throughout the length of the stuffing tube;

means for continuously feeding the casing with said seam on the outside forward surrounding the stuffing tube and causing it to become shirred surrounding the stuffing tube to provide a supply of shirred casing surrounding the stuffing tube, the casing extending off the discharge end of the stuffing tube; whereby the casing may be closed downstream from the discharge end of the stuffing tube to provide a leading end closure for a unit length of the casing;

whereby sausage meat may be intermittently forced through the stuffing tube out of its discharge end and into the casing, the sausage meat entering the casing acting to draw the casing forward form the shirred supply off the discharge end of the stuffing tube to provide a unit length of the casing in which the sausage meat is stuffed;

whereby the casing may be closed at the trailing end of the unit length to provide a trailing end closure for the unit length;

whereby the casing may again be closed at a point upstream from the said trailing end closure to provide a leading end closure for the next unit length; and

whereby the closing and sausage meat forcing steps may be repeated.

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**4,479,284**

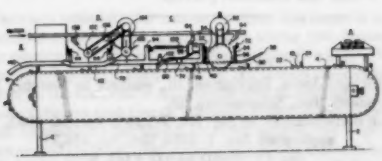
## CRAB PROCESSING MACHINE

**Calvert B. Tolley, and Andrew T. Tolley, both of Wingate, Md., assignors to Sea Savory, Inc., Cambridge, Md.**

**Continuation-in-part of Ser. No. 169,150, Jul. 15, 1980, Pat. No. 4,380,094. This application Sep. 30, 1982, Ser. No. 431,285**

**Int. Cl.³ A22C 29/02**

**U.S. Cl. 17—71** **12 Claims**



1. A machine for processing various species of crabs to produce cleaned crab bodies ready for meat removal, comprising an elongated supporting frame, at least three work stations spaced along the length of the machine, an endless chain supported on vertical rotating support and driving wheels at the loading and delivery ends of the frame and having an elongated section passing through the work stations, a plurality of crab holders mounted on said belt and spaced along the length thereof,

(a) the means at the first work station comprising means for:

i. holding the crab body in position on its holder,

ii. sawing through the carapace of the crab body longitudinally of the crab body and centrally of its ends,

iii. sawing through both ends of the crab body to remove the claws, flippers, walking legs and ends of the carapace from the crab body, and

iiii. cleaning the visceral cavity,

(b) an elongated bar extending from the downstream side of the first work station throughout the second and third work stations,

(c) the means at the second work station comprising:

i. means on the elongated bar positioned in the path of movement of the central cut in the carapace for moving the side parts of the carapace transversely of the machine for initially separating the part of the carapace from the crab body, and

ii. means mounted on a horizontal pivot positioned above the bar and having diverging arms extending from the pivot to opposite sides of the bar, each arm having a vertical flange positioned to engage a side edge of the central cut of the carapace for moving the side parts of the carapace transversely to complete their removal from the crab body,

(d) the means at the third work station comprising:

i. means for holding the crab body in position on its holders, and

ii. upstream and downstream brushes for cleaning the visceral cavity of each crab body.

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**4,479,285**

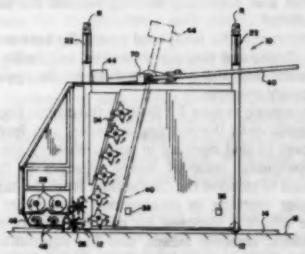
## COTTON MODULE DISPERSING AND FEEDING SYSTEM WITH IMPROVED ELECTRICAL CONTROLS

**Eddie D. Ragan, Slaton, Tex., assignor to Continental Conveyor & Equipment Co., Inc., Sherman, Tex.**

**Filed Oct. 9, 1981, Ser. No. 310,209**

**Int. Cl.³ D01G 7/08**

**U.S. Cl. 19—64.5** **12 Claims**



1. A system comprising apparatus for decompacting modules of compacted seed cotton and for feeding the decompacted seed cotton from the apparatus, means to cause relative movement between the modules and said apparatus, module containment means automatically moveable through rotation from a first position out of contact with the modules to be decompacted to a position generally vertical and generally parallel with the trailing face of the last module to be decompacted in response to the trailing face of the last module and said apparatus being located at a predetermined position with respect to each other and means responsive to the position of the moving module containment means to automatically stop

the rotational movement of said containment means toward said last module to be compacted.

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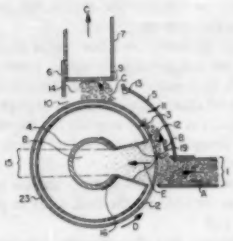
**4,479,286**

## APPARATUS TO EXTRACT FINE TRASH AND DUST DURING HIGH-VELOCITY DISCHARGING OF COTTON FROM OPENER CLEANER

**Roger S. Brown, Clemson, S.C.; Charles L. Shepard, Chlamette, and Laurey J. Richard, Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Oct. 15, 1981, Ser. No. 311,702**
**Int. Cl.³ D01C *9/08***
**U.S. Cl. 19—200** **3 Claims**



1. An apparatus to extract fine dust and trash from cotton fiber comprising in combination:

(a) a rotating cylinder with a plurality of perforations through the surface, said perforations sized for the retention of the cotton fiber tufts on the surface thereof;

(b) a stationary conduit juxtaposed co-axially inside said rotating cylinder, said stationary conduit opened on one side thereof to receive fine dust and trash as it passes through the perforations of said rotating cylinder, said conduit also providing bearing support for said rotating cylinder;

(c) an internal baffle juxaposed co-axially between the rotating cylinder and stationary conduit, said baffle opened on the same side and corresponding to the opening of the stationary conduit;

(d) a pneumatic system for feeding the cotton fiber, fine dust and trash onto the rotating cylinder, said feeding means adjacent to said opening in said stationary conduit;

(e) a pneumatic removal means adjacent to the rotating cylinder to remove the cotton fiber from the surface of the cylinder working in combination with a flat adjustable baffle which is attached on one end and parallel to the pneumatic removal means, said flat adjustable baffle adjusted to form an opening between the end thereof and the rotating cylinder, said opening allowing a flow of outside air at atmospheric pressure into the apparatus to a low pressure zone between the pneumatic removal means and the rotating cylinder thus assisting the pneumatic removal means in lifting the cotton fiber from the surface of the rotating cylinder; a curved adjustable baffle attached on one end to the pneumatic feeding means, juxtaposed co-axially to the external cylindrical surface of the rotating cylinder and adjusted to form an opening betwen the pneumatic removal means and the end of the curved baffle, said opening allowing outside air at atmospheric pressure to flow into the apparatus to the low pressure zone between the pneumatic removal means and the rotating cylinder thus assisting the pneumatic removal means in lifting off the cotton fiber from the surface of the rotating cylinder; and

(f) a pneumatic removing means for removing the fine dust and trash from the statioary conduit.

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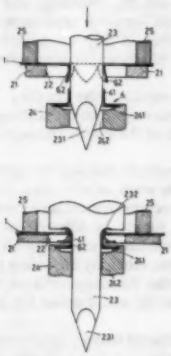
**4,479,287**

## EYE HOLE FOR ROPING REINFORCED BY GROMMET METAL FITTINGS AS IN SHEET-LIKE ARTICLES

**Hitoshi Asaka, 18-24, Takada-cho, Ibaraki-shi, Osaka 567, Japan**

**Filed Mar. 25, 1982, Ser. No. 361,896**
**Claims priority, application Japan, May 10, 1981, 56-159311; Oct. 24, 1981, 56-170297**
**Int. Cl.³ A43C *5/00*; A43D *100/00***
**U.S. Cl. 24—141** **6 Claims**



1. A method for fabricating reinforced eye holes with a grommet in sheet-like material, said grommet including a flange portion and a central cylindrical portion, comprising the steps of pressing in a first direction a guide bar including a cutter towards said sheet-like material to make radial incisions extending from a central point therein, said radial incisions forming a plurality of tongues substantially equal to one-half the outer diameter of said cylindrical portion of said grommet;

supporting said grommet cylindrical portion on a grommet supporting member having an aperture therein and concurrently with said step of pressing said cutter moving said grommet supporting member in a second direction opposite said first direction to receive said cutter within said aperture thereby inserting said grommet cylindrical portion amidst said tongues lying adjacent said flange portion of said grommet; and

pressing an upper part of said guide bar having a groove therein to receive said flange to compress said cylindrical portion over said tongues to deform and expand said outer cylindrical portion in the said groove toward said tongues and entrap said sheet-like materials and said tongues within said deformed portion.

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**4,479,288**

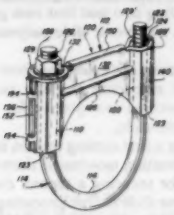
## CLAMP FOR TUBING

**W. Richard Jones, Barrington, Ill., assignor to Mercury Metal Products, Inc., Schaumburg, Ill.**

**Continuation-in-part of Ser. No. 372,097, Apr. 26, 1982,. This application Jan. 7, 1983, Ser. No. 456,375**
**Int. Cl.³ B65D *63/00*; F16L *3/10***
**U.S. Cl. 24—277** **7 Claims**

1. A U-bolt clamp saddle comprising: an originally, substantially flat sheet metal stamping of generally rectangular configuration having a transverse central segment forming said member into opposite, identical mirror parts, each mirror part

having a semicircular cutout portion along its end edge opposite said segment, a rectangular notch in each of the side edges of the stamping aligned with and located at the ends of said segment whereby a portion of each notch enters both mirror parts, said stamping having two grooves formed therein, respectively parallel with and adjacent said opposite side edges, said grooves extending the entire length of the stamping between said end edges, each groove intersecting and being interrupted by a respective rectangular notch while said stamping is in the flat condition, said saddle being formed by reason of said member being folded upon itself along said segment and through said notches such that said mirror parts are in substan-



tially face-to-face juxtaposition and each half groove mates with its opposite half to form a sleeve formation having a through-passageway adapted to receive the leg of a U-bolt, each notch forming bearing edges at ends of the respective passagesway, each sleeve formation having a narrow lateral wing with at least a pair of cooperatively interlocking notch and tongue means for preventing distortion or deformation thereof during tightening of the clamp, said tongue means being integral with and protruding beyond a side edge of one of the mirror parts and said notches being formed in the half groove of the second mirror part opening to a side edge thereof.

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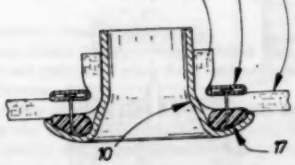
**4,479,289**

## FASTENER INTENDED ESPECIALLY FOR CANVAS

**Göran Rutgersson, Ekebacken, S-440 30- Marstrand, Sweden**

**Filed Dec. 21, 1982, Ser. No. 451,748**
**Claims priority, application Sweden, Dec. 28, 1981, 8107803**
**Int. Cl.³ A44B *13/00, 17/00***
**U.S. Cl. 24—687** **8 Claims**




1. Fastener, especially for canvas or other thin material such as laminated material and comprising a sleeve (10) having a tubular portion (11) which in use extends through a hole (23) in the material (22) and a flange portion (12, 24) on both sides of the material, the material being located with an area around the said hole between said flange portions, a pair of ring-shaped surfaces respectively arranged to press against the opposite surfaces of said material, one of said ring-shaped surfaces being provided with projections (3) arranged to be pressed through the material and the other ring-shaped surface being formed on a supporting ring (17) made from a material which has a lower hardness in comparison with the material of the projections, said projections being inserted into the material of said supporting ring, through the supporting ring and bent on the outside of said ring, one of said flange portions being associated with said one ring-shaped surface and another of said flange portions being associated with the outside of said supporting ring, said flange portions being connected by said tubular portion and being pressed in a direction against said canvas or other thin material thereby exerting a pressure of said ring-shaped surfaces against the surfaces of said canvas or other thin material and a pressure against the portions of said projections which are bent on the outside of said supporting ring.

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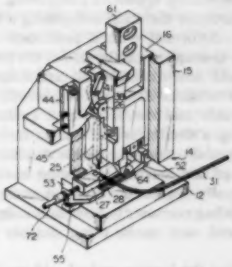
**4,479,290**

## SPACE FORMING AND STOP FIXING APPARATUS FOR FASTENER CHAINS

**Tatsuo Osaki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan**

**Filed May 7, 1982, Ser. No. 376,143**
**Claims priority, application Japan, May 20, 1981, 56-76183**
**Int. Cl.³ B29D *5/00***
**U.S. Cl. 29—33.2** **5 Claims**




1. An apparatus for forming a space in and simultaneously fixing a stop to a fastener chain consisting of interengaged continuous stringers in which a space punch and a driver punch are provided for common movement, characterized in that the apparatus comprises:

a casing having a tubular frame portion;

a punch holder slidably received in said tubular frame portion and having said space and driver punches drivingly connected to the punch holder;

drive means for reciprocating said punch holder in said tubular frame portion;

a cutting punch provided between said driver punch and an inner wall of said tubular frame portion;

a bender mounted on said casing for movement between a position in which it projects into the path of the driver punch movement and a retracted position in which it is out of the path of the driver punch movement; and

a wire feeder for feeding a stop forming wire onto said bender,

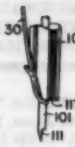
said cutting punch having an edge at a lower end thereof to cut said wire by a predetermined length, the lower end of said cutting punch being bifurcated to form a stop of a bottom-side-opened rectangular shape in cooperation with the bender, said cutting punch further having a channel for slidably guiding said driver punch so that the driver punch moves relative to the cutting punch to press down on said stop,

said cutting punch connected to said punch holder for reciprocation therewith via a releasable lost motion means for substantially disconnecting said cutting punch from the reciprocable movement of said punch holder after said cutting punch has moved down to a preselected point such that further downward movement of said punch holder beyond said point drives only said space and driver punches.

## 4,479,291
## HAIR IMPLANTING APPLIANCE

Shiro Yamada, Aichi, Japan, assignor to Nido, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 165,241, Jul. 2, 1980, Pat. No. 4,378,019. This application Sep. 8, 1982, Ser. No. 415,849
Claims priority, application Japan, Jul. 3, 1979, 54-83509
Int. Cl.³ A61B 17/00
U.S. Cl. 128—330 12 Claims




1. A hair implanting appliance comprising:

means to penetrate the scalp comprising a needle having its leading end formed with a protrusion and a notch of generally U-shape along the side of the leading end of said needle, said notch being sized and shaped to retain the root of an artificial hair to be implanted;

means to guide said needle without penetrating the scalp comprising a sheath formed with a through hole which has substantially the same inside diameter as the outside diameter of said needle, said sheath having a scalp abutting generally flat leading end and an inclined guide surface extending rearwardly from said scalp abutting generally flat end, said needle being slidably received in said sheath

(i) such that the leading end of said needle can protrude from said scalp abutting generally flat leading end of said sheath and project into a human skin to a depth necessary for the hair implantation and

(ii) such that scalp abutting generally flat leading end of said sheath cooperates with said needle to retain the hair root and control the positioning of the hair root in said appliance; and

means to reciprocate said needle axially to cause the leading end of said needle to protrude from the leading end of said sheath.

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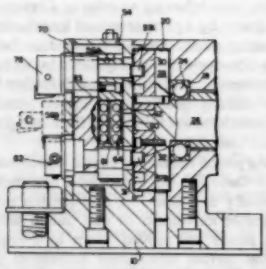
## 4,479,292
## POLYGON BOX TOOLS APPLIED TO AUTOMATIC SCREW MACHINES

Harold E. Wheeler, Athens, Pa., assignor to Wheeler Tool Company, Athens, Pa.

Filed Sep. 29, 1982, Ser. No. 426,342
Int. Cl.³ B23B 3/28
U.S. Cl. 29—56 1 Claim



1. A polygon box tool comprising:

a main housing,

a cam shaft in said main housing which is driven by a drive means,

a cam secured to said cam shaft,

said cam including first and second grooves in one face of said cam, said first groove in said cam being formed in said cam at a greater radial dimension than said second groove in said cam face,

a front housing,

axially aligned first and second transverse slides in said front housing in par-llel relationship with each other with said first and second cam grooves facing said transverse slides,

a first cam follower pin extending from said first transverse slide and extending into said first cam groove for reciprocating said first transverse slide perpendicular to the axis of the tool,

a second cam follower pin extending from said second transverse slide and extending through said first transverse slide into said second cam groove for reciprocating said second transverse slide,

means for securing a first cutting tool on said first transverse slide for reciprocating movement therewith, and

a second means for securing a second cutting tool on said second transverse slide for reciprocating movement therewith,

whereby said first and second cutting tools perform work on a piece of material simultaneously.

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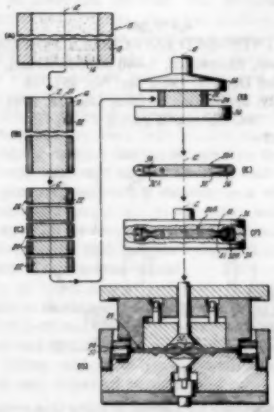
## 4,479,293
## PROCESS FOR FABRICATING INTEGRALLY BLADED BIMETALLIC ROTORS

John A. Miller, Jupiter; Ralph E. Anderson, Palm Beach Gardens, and Marvin M. Allen, Lake Worth, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,149
Int. Cl.³ B21K 3/00
U.S. Cl. 29—156.8 R 9 Claims



1. A process for fabricating an integrally bladed bimetallic rotor having coarse grained airfoils and an equiaxed fine grained hub portion, comprising the steps of:

(1) forming a bimetallic preform having an axis and comprising a first cylinder of a first superalloy metal surrounded by a second cylinder of a second superalloy metal, said second superalloy metal being selected to have a gamma prime solvus temperature at least 25° F. lower than the gamma prime solvus temperature of said first superalloy metal, said step of forming a bimetallic preform including the step of metallurgically bonding said second cylinder along its entire inner surface to said first cylinder, and

including imparting to said first and second superalloys the property of exhibiting superplastic behavior at a first strain rate and first forging temperature without incurring substantial grain growth;

(2) isothermally forging, at said first temperature and first strain rate, said bimetallic preform, said step of forging comprising forging said first cylinder into the shape of said hub portion and said second cylinder into the shape of said airfoils; and

(3) heat treating the forged article to effect full gamma prime solutioning in the airfoils and partial gamma prime solutioning in the tub portion and to restore essentially normal strength and hardness to both superalloys.

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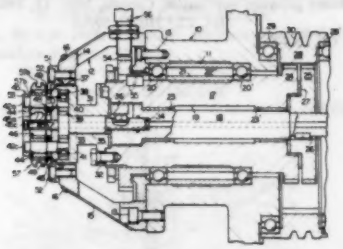
4,479,294

## SECONDARY WORKING APPARATUS

Hiroaobu Sekimoto, and Norio Sato, both of Fuji, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 14, 1982, Ser. No. 388,135
Claims priority, application Japan, Aug. 27, 1981, 56-134710
Int. Cl.³ B23P *15/14*; B23F *19/06*
U.S. Cl. 29—159.2 9 Claims



1. A secondary working apparatus for secondarily machining a blank preliminarily formed with internal serrations on a cylindrical plane having a center axis therethrough, comprising

a stationary housing structure;

support means for supporting the blank with the center axis of said cylindrical plane fixed with respect to the housing structure;

a plurality of shafts each having a center axis substantially parallel with the center axis of said cylindrical plane and rotatable with respect to said housing structure about an axis substantially coincident with the center axis of said cylindrical plane and an axis substantially coincident with the center axis of the shaft, each of the shafts having a cylindrical eccentric axial portion having a center axis substantially parallel with and radially offset from the center axis of the shaft; and

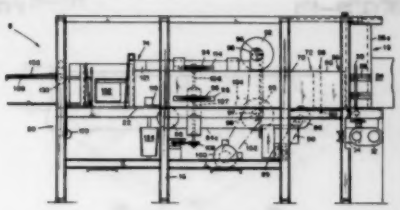
generally cylindrical machining tools coaxially carried on the eccentric axial portions of said shafts, respectively, and each having a center axis substantially coincident with the center axis of the eccentric axial portion of each of said shafts, said machining tools including at least one finishing tool formed with external serrations to be in mesh with the internal serrations of said blank, and a deburring tool having surface portions engageable with crest face portions of the internal serrations of the blank.

4,479,295

## METHOD AND APPARATUS FOR MANUFACTURING DISCRETE LAYERED ARTICLES FROM A CONTINUOUS WEB

Carroll Musick, Erwin, Tenn., assignor to Erwin Welding & Machine, Inc., Erwin, Tenn.

Filed Mar. 27, 1981, Ser. No. 248,486
Int. Cl.³ B23P *17/00*; B41L *1/32*
U.S. Cl. 29—417 13 Claims



1. A method for manufacturing a plurality of discrete articles having a non-rectangular cross-sectional shape from a web of batting of indeterminate length, said method comprising:

feeding said web into a forming chute to form a plurality of layers of said batting having a total length which is greater than the length of the discrete articles; removing a continuous notch from said plurality of layers to define a non-rectangular cross-sectional shape in said layers; separating a predetermined portion of said notched layeres to define a separated portion and a following portion and securing said layers of said separated portion to define a discrete article.

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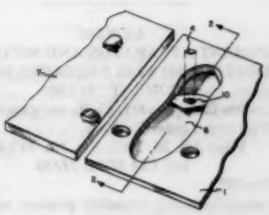
4,479,296

## METHOD OF MANUFACTURING A RUBBER SHOE SOLE

Kenneth C. Sabins, Windsor, Vt., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 21, 1983, Ser. No. 487,399
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—527.1 18 Claims



1. A method for the manufacture of a rubber shoe sole having a decorative metal piece incorporated therein comprising:

(a) placing a metal slug in a fenced area of a shoe mold;

(b) placing an uncured rubber slug on top of the metal slug in said shoe mold;

(c) closing said shoe mold; and

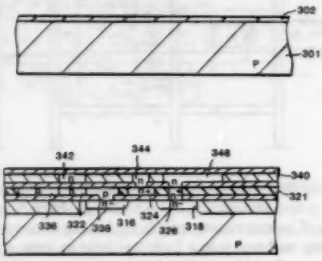
(d) applying a sufficient amount of heat and pressure to said mold so as to simultaneously shape said metal slug and to shape and vulcanize said rubber slug, said metal slug having a melting temperature from about 0° C. to 80° C. greater than the temperature used to vulcanize said rubber slug.

## 4,479,297

## METHOD OF FABRICATING THREE-DIMENSIONAL SEMICONDUCTOR DEVICES UTILIZING $CeO_2$ AND ION-IMPLANTATION.

**Yoshihisa Mizutani, and Shinichiro Takasu, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 9, 1982, Ser. No. 386,808**
**Claims priority, application Japan, Jun. 22, 1981, 56-95344**
**Int. Cl.³ H01L *21/20, 21/265***
**U.S. Cl. 29—571** **9 Claims**




1. A method of fabricating a semiconductor device having a first semiconductor layer which comprises the steps of:

(a) forming a single crystalline oxide insulation layer which is selected from the group consisting of Ce and other rare earth elements where said layer belongs to a system which is selected from the group consisting of a tesseral system, a tetragonal system and an orthorhombic system on at least part of the first semiconductor layer;

(b) selectively introducing ions, which convert semiconductor material into an insulation material by reacting with said first semiconductor layer, through said single crystalline oxide insulation layer into at least part of said first semiconductor layer;

(c) converting said ion introduced region into an insulation layer, which is formed beneath said single crystalline oxide insulation layer; and

(d) forming a second semiconductor layer on said single crystalline oxide insulation layer and said first semiconductor layer.

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## 4,479,298

## ALIGNMENT APPARATUS AND METHOD FOR MOUNTING LSI AND VLSI PACKAGES TO A PRINTED CIRCUIT BOARD

**Paul Hug, Santa Clara County, Calif., assignor to Storage Technology Partners, Louisville, Colo.**

**Filed Jul. 26, 1983, Ser. No. 517,481**
**Int. Cl.³ H01L *21/60***
**U.S. Cl. 29—589** **7 Claims**

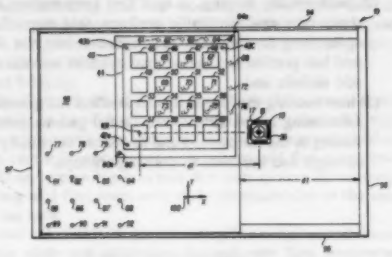
1. In a manufacturing assembly process wherein an integrated circuit (IC) package with a multiplicity of precisely placed leads must have said leads aligned with respect to a corresponding set of precisely placed pads on a printed circuit board prior to the bonding of said leads to said pads, and where said leads are accurately fixed in position with respect to each other but are not accurately fixed with respect to said IC package, an apparatus for aligning said leads with respect to said pads, and maintaining said alignment while said leads are bonded to said pads, said apparatus comprising:

coarse alignment means for coarsly aligning said leads with respect to a known coordinate system;

fine alignment means for precisely aligning said leads after said leads are first coarsely aligned therewith through the use of said coarse alignment means;

mounting means for mounting said printed circuit board so that said pads are aligned with said coordinate system; and

positioning means for positioning the pads of said printed



circuit board and the leads of said aligned IC package such that said aligned leads make contact with said corresponding pads, and for maintaining this aligned position while said leads are bonded to said pads.

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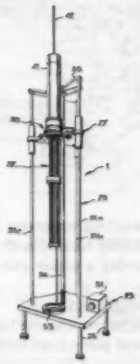
## 4,479,299

## MACHINE AND METHOD FOR ASSEMBLING HIGH VOLTAGE FUSES WITHOUT AN INTERNAL CORE

**Gilles Fecteau, Quebec, Canada, assignor to Hydro Quebec, Montreal, Canada**

**Filed Jul. 8, 1982, Ser. No. 396,333**
**Claims priority, application Canada, Mar. 11, 1982, 398147**
**Int. Cl.³ H01H *69/02***
**U.S. Cl. 29—623** **18 Claims**



1. An improved machine for assembling high voltage fuses without an internal core, said fuses comprising at least one fusible element helically wound inside a tubular casing made of electrically insulating material and filled with a pulverulent arc-quenching filler, said machine comprising:

a base provided with means for receiving and supporting the tubular casing of the fuse;

a platform slidably mounted along guide means positioned so as to allow motion of the platform in a direction perpendicular to the base;

means for moving the platform along the guide means towards the base or away from the base;

a mobile head mounted onto the platform, said mobile head comprising a rotation axis directed towards the base and means for helically winding said at least one fusible element about the mobile head and subsequently helically unwinding said at least one fusible element inside the tubular casing;

means for rotating said mobile head about its axis in at least one direction;

hopper means for filling said tubular casing with a pulverulent arc-quenching filler in order to secure the fusible elements when the same are unwound from the mobile head;

at least three threaded rods symmetrically mounted about the rotation axis of said mobile head, the threads of said rods forming said means for winding and unwinding said at least one fusible element, and

means for simultaneously rotating the threaded rods at the same speed and in the same direction about their respective axes, said means for rotating the threaded rods being coordinated with the means for moving the platform along its guide means so that the rotation of the rods about their axes is synchronized with the translation movement of the slidable platform on which the rods are mounted when said platform moves away from the base and is carried in a direction ensuring self-unwinding of said at least one fusible element mounted onto the threads of the rods inside the tubular casing.

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**4,479,300**

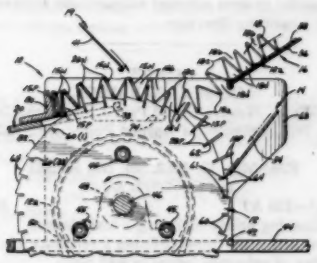
## METHOD AND APPARATUS FOR ASSEMBLING BATTERY CELL ELEMENTS

**Douglas R. Savage, Park Ridge, Ill., assignor to GNB Batteries Inc., Mendota Heights, Minn.**

**Filed Mar. 14, 1983, Ser. No. 475,279**

**Int. Cl.³ H01M 6/00**

**U.S. Cl. 29—623.1** **36 Claims**



1. A method of assembling battery cell elements with a rotary drum having electrode plate-receiving means about the periphery thereof, comprising the steps of:

rotatably driving said drum,

positioning first plates of common polarity into said plate receiving means of said drum as said drum is rotated such that said plates are carried by said drum,

positioning a strip of separator sheet over said first plates carried by said drum as said drum is rotated with said sheet assuming an accordion-folded configuration defining downwardly-opening folds each encompassing a respective one of said first plates and alternate upwardly-opening folds,

positioning second plates of a common polarity opposite to said first plates successively in said upwardly-opening sheet folds as said drum is rotated, and

continuously removing from said rotating drum said strip of separator sheet with said first and second plates occupying said alternate folds on opposite sides thereof.

**4,479,301**

## CABLE TERMINATING TOOL

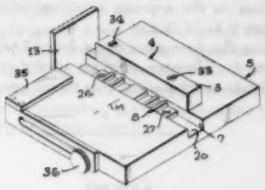
**Alois R. Resch, Heilbronn-Kirchhausen, Fed. Rep. of Germany, assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Apr. 26, 1982, Ser. No. 371,568**

**Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120751**

**Int. Cl.³ H01R 43/04**

**U.S. Cl. 29—721** **18 Claims**



1. A cable terminating tool for connecting the conductors of a multiconductor flat cable to respective terminals of a connector comprising:

a mounting plate;

a centering means coupled to said mounting plate for receiving the connector and locating the connector in a predetermined position relative to said mounting plate, said centering means comprising a plurality of pairs of ribs provided on a surface of said centering means, said ribs running parallel to the direction of insertion of said flat cable, each of said ribs comprising a member having a somewhat trapeziodal cross section shaped to cooperate with counter surfaces provided on said connector to hold the connector stationary after it is placed in the centering means, each corresponding counter surface to the members of each pair of ribs provided on said connector is adapted to engage a surface of a respective member of each of said pairs of ribs;

stop means coupled to said mounting plate and having a cable abutting face for positioning an end of the cable at a point adjacent to said predetermined position; and

press means mounted on said mounting plate and operable to press the conductors of a cable into the conductor receiving terminals of a connector received by said centering means.

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**4,479,302**

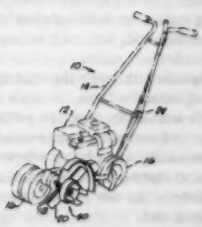
## TRIMMER FOR LAWN SPRINKLERS

**Werner H. Richter, 418 Cabrillo Rd., Arcadia, Calif. 91006**

**Filed Jul. 18, 1983, Ser. No. 514,558**

**Int. Cl.³ A01B 45/00; A01D 35/00**

**U.S. Cl. 30—122** **5 Claims**



1. Apparatus for trimming away excess growth from the area around sprinkler heads and which is easily removable

from a powered rotary cutter blade assembly of a powered driven edger, especially of the type having cutter blade rotation about a vertical axis, which comprises:

cup-shaped cutter member having a circular flat base plate, a depending annular flanged portion affixed to said circular flat base plate at the outer peripheral edge of the circular flat plate and of a dimension sufficient to be placed about a lawn sprinkler head without coming in contact with the head;

cutter portions formed about said flanged extension;

attachment means affixed to the surface of the circular flat base plate on the opposite side from which the flanged extension is located; and

the circular flat base plate being formed with a clearance aperture for allowing portions of the powered driven edger blade attachment to pass therethrough.

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**4,479,303**

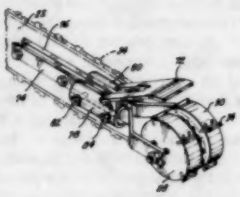
## CHAIN SAW ATTACHMENT

**Douglas S. Gardner, 427 Peters Rd., Randle, Wash. 98377**

**Filed Jan. 17, 1983, Ser. No. 458,238**

**Int. Cl.³ B27B *17/02***

**U.S. Cl. 30—383** **5 Claims**



1. A chain saw attachment for mounting on a portable power-driven chain saw having a saw bar and an endless saw chain disposed for movement around said bar, said chain saw attachment comprising:

(a) a cutting head assembly including:

(1) a first cylindrical wheel, said wheel having a central axial aperture and mounting means in the perimeter of said wheel for holding a plurality of cutting knives;

(2) a second cylindrical wheel, said wheel having a central axial aperture and mounting means in the perimeter of said wheel for holding a plurality of cutting knives;

(3) a drive sprocket positioned between said first and second wheels, said sprocket being adapted to receive and be driven by said saw chain;

(4) a plurality of cutting knives, said cutting knives being individually positioned in said mounting means in the perimeters of said first and second wheels and held in said mounting means by individual securing means; and

(5) securing means for holding closely together in a unitary assembly said first and second wheels and said drive sprocket;

(b) an axle extending through the central axial apertures of said first and second wheels, the ends of said axle extending normally outwardly from the center of said wheels;

(c) first and second mounting arms receiving the ends of said axle, said mounting arms being adapted to be secured to said saw bar so that said axle is held in a plane perpendicular to the plane of the saw bar, said mounting arms having beveled edges; and

(d) a safety cover located above said cutting head assembly, said safety cover being joined to gripping means which slidably fit on said beveled edges of said first and second mounting arms.

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**4,479,304**

## FASTENING ELEMENT FOR LENGTH MEASURING DEVICE

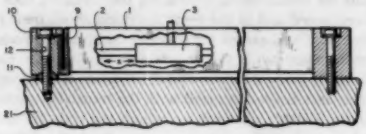
**Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany**

**Filed Apr. 21, 1983, Ser. No. 487,211**

**Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219083**

**Int. Cl.³ G01B *11/04***

**U.S. Cl. 33—125 R** **4 Claims**



1. In a length measuring instrument for measuring the position of first and second objects; said instrument comprising: a carrier which defines first and second ends, a measuring scale mounted to the carrier to extend along a measuring direction, a scanning unit positioned to scan the scale, and means for fastening the first end of the carrier to the first object; the improvement comprising:

means for mounting the second end of the carrier to the first object to provide a translatory degree of freedom extending along the measuring direction, said means for mounting the second end of the carrier comprising:

a fastening element secured to the second end of the carrier, said element defining a first region and a second region disposed between the first region and the carrier;

means for securing the first region of the fastening element to the first object; and

means for defining an array of slits in the second region of the fastening element, said array of slits arranged in a meander pattern oriented substantially transversely to the measuring direction.

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**4,479,305**

## MEASURING BRIDGE

**Daniel P. Wendl, Waukesha, and Paul J. Lukezich, Greenfield, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.**

**Filed Mar. 12, 1982, Ser. No. 357,581**

**Int. Cl.³ G01B *5/14***

**U.S. Cl. 33—180 AT** **26 Claims**

1. A measuring bridge including a main frame,

means on said main frame defining a reference plane and a plurality of reference points in said plane,

a plurality of support assemblies for supporting a vehicle in a fixed orientation relative to said reference plane and the reference points,

coupling means for securing each support assembly in a discrete location relative to said reference plane and spaced a predetermined distance from each of the other said support assemblies and from the reference points,

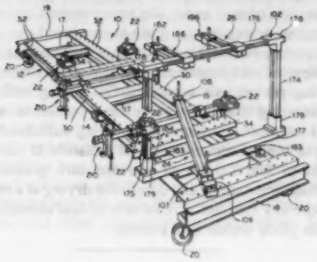
each support assembly including base means releasably securable to said main frame by said coupling means, a support element and adjustment means for mounting said support element on said base means,

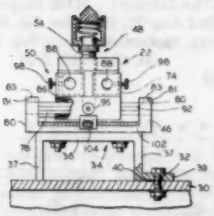
each said adjustment means being constructed and arranged for displacing said support elements three dimensionally relative to said base means whereby said support elements can be arranged in a predetermined array relative to said reference plane,

each of said adjustment means including three dimensional indicating means so that the position of each support element relative to the reference plane and the reference points can be determined,

each said support element being adapted to be engaged by a

datum point on the underside of a vehicle for supporting said vehicle in a predetermined orientation relative to said reference plane and for indicating misalignment of any such datum point, and





gauge means mounted on said frame in a predetermined orientation relative to said reference plane and the reference points for determining the relative position of other datum points on damaged portions of said vehicle relative to said reference plane and said reference points.

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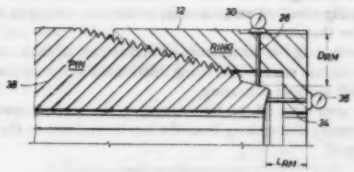
**4,479,306**

## PROCESS OF MANUFACTURING AND USING GAUGES FOR VERIFYING THREADS OF TUBULAR MEMBERS

**Erich F. Klementich, Houston, Tex., assignor to Oil Technology Services, Houston, Tex.**

**Filed Jun. 7, 1982, Ser. No. 385,772**
**Int. Cl.³ G01B 3/48, 5/16**
**U.S. Cl. 33—199 R** **16 Claims**



1. A ring gauge for verifying the acceptability of the seal diameter and standoff of the pin ends of a plurality of tubular members intended to be uniformly threaded, said gauge being made from a selected tubular member having box and pin ends with threads within acceptable tolerance limits, said gauge being made from a process, which comprises

cutting the pin end and box end from the selected tubular member,

machining a pocket surface in the box end radially away from the tip of the pin end, to remove material therefrom so as to insure substantially full engagement of the threads when the pin end and box end are hand tightened together,

machining out the shoulder of the box end longitudinally away from the end of the pin end, thereby assuring the existance of standoff when the pin end and box end are hand tightened together,

boring a lateral hole through the wall of the box end, the hole internally opening slightly behind the tip of the pin end,

boring a longitudinal hole through the shoulder in the box end, the hole internally opening longitudinally opposite the end of the pin end,

inserting the plunger of a seal-diameter gauge through said lateral hole for measuring the seal diameters of the pin ends of said plurality of tubular members, and

inserting the plunger of a standoff gauge through said longitudinal hole for measuring the standoffs of the pin ends of said plurality of tubular members.

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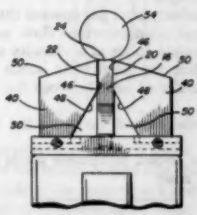
**4,479,307**

## GUN SIGHT FOR HAND AND SHOULDER GUNS

**Robert B. Pomeranz, 651 Campfire Rd. SE., Rio Rancho, N. Mex. 87124**

**Continuation-in-part of Ser. No. 370,286, Jun. 4, 1982, abandoned. This application Nov. 1, 1983, Ser. No. 547,636**
**Int. Cl.³ F41G 1/10**
**U.S. Cl. 33—233** **10 Claims**



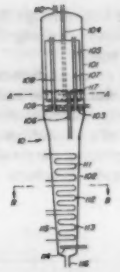
1. In combination with a gun including an elongated barrel having opposite front and rear ends, a sight assembly including front and rear sights, said front sight being mounted on a forward portion of said gun barrel and said rear sight being mounted from said gun rearward of said front sight and in substantial front-to-rear alignment with said front sight, said front and rear sights defining a sight path extending therebetween, said front sight comprising a upstanding vertically elongated blade sight member having vertical parallel planar outwardly facing opposite side faces joined at their upper ends by a transverse horizontal top surface, said rear sight including a pair of laterally spaced apart opposite side plates disposed transverse to and on opposite sides of said sight path and including inner upstanding opposing transverse end edges having relatively angulated upper and lower portions and top surfaces extending oppositely outward from said end edges, said upper portions of said end edges being vertical and spaced apart a predetermined distance, the included angle between each of said end edge upper portions and the corresponding plate top surface being readily visually ascertainable as less than 90° and more than 45°, said lower portions of said end edges being downwardly divergent and defining an included angle of less than 90° and more than 45°.

**4,479,308**

## PROCESS AND DEVICE FOR RECOVERING HEAT FROM A PARTICULATE SOLID

**Corey A. Bertelsen, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Mar. 30, 1982, Ser. No. 363,725**
**Int. Cl.³ F26B *3/10, 17/10***
**U.S. Cl. 34—10** **10 Claims**



1. A process for recovering heat from a hot particulate solid containing diverse particle sizes which comprises:

(a) fluidizing the hot particulate solid in a first zone with a gas having a lower initial temperature than the solid, whereby the solid is partially cooled and the fluidizing gas is heated;

(b) introducing the partially cooled particulate solid from the first zone into the top of a swagged vertically elongated second zone containing internal means to limit substantial vertical backmixing and to increase the average residence time of the particulate solids passing downward therethrough;

(c) passing a relatively cool gas upward through the second zone in general countercurrent flow to the downward moving particulate solids at a velocity sufficient to only partially fluidize the particulate solids and to allow a significant transfer of heat between the particulate solid and the gas;

(d) recovering the heated gas from the first and second zones; and

(e) removing the cooled particulate solids from the bottom of the second zone.

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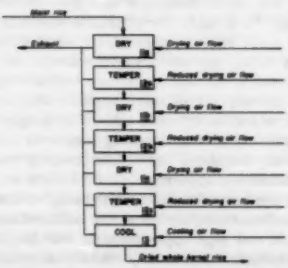
**4,479,309**

## METHOD AND APPARATUS FOR DRYING CEREAL GRAIN

**Raymond C. Tolson, 1194 Devonshire, Greenville, Miss. 38701**

**Filed Apr. 5, 1982, Ser. No. 365,168**
**Int. Cl.³ F26B *3/14***
**U.S. Cl. 34—13** **9 Claims**




1. In a method of drying cereal grain or the like which includes the steps of heating air, directing a first drying airflow of the heated air into the grain during a drying period to extract moisture from said grain at a rate which causes moisture gradients to build up within the individual kernels of said grain and thereafter subjecting said grain to a tempering period during which said moisture gradients reduce within the individual kernels of said grain, the improvement comprising:

continuing drying of said grain at a reduced rate during said tempering period by directing a less desiccating second airflow of said heated air into said grain during said tempering period, said second airflow being sufficiently less desiccating than said first airflow to enable reduction of said moisture gradients while being sufficiently dessicating to inhibit accumulation of moisture at the outer portions of said kernels as said moisture gradients reduce, including initiating said continued drying at a reduced rate before any substantial reduction of said moisture gradients takes place within said kernels.

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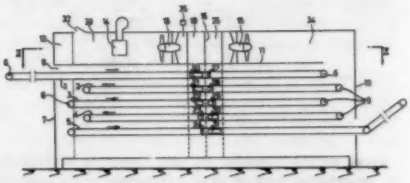
**4,479,310**

## CONTINUOUS DEHYDRATION DEVICE AND PROCESS

**Francois Duc, "La Sabatiere", 24100 Bergerac, France**

**Filed Aug. 20, 1982, Ser. No. 409,730**
**Claims priority, application France, Sep. 3, 1981, 81 16746**
**Int. Cl.³ F26B *3/04***
**U.S. Cl. 34—34** **9 Claims**



1. A method for continuous dehydration of agricultural products in an enclosed housing, comprising

sending said products continuously into said housing and moving them horizontally from one end to the other at the upper end of the housing,

then dropping them to a lower level and sending them back at a lower horizontal layer and so on from level to level, and withdrawing the products from said housing from the lowest level,

while blowing hot air in toward a central portion of the housing,

collecting the blown air as two separate streams for partial recycling,

heating one said stream only, while also taking in fresh air for that stream,

distributing the air mixture of that stream at each said level, the second stream also being distributed to the various levels but without reheating,

the area ratio of the first stream to the second stream constantly diminishing from the top level down to the bottom level.

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**4,479,311**

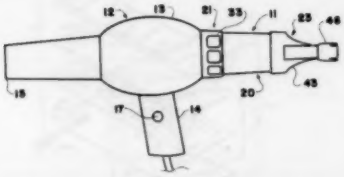
## HAIR REMOVING APPARATUS

**David M. Blanco, 1840 Virginia La., Billings, Mont. 59102**

**Continuation-in-part of Ser. No. 228,766, Jan. 27, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,259**
**Int. Cl.³ A45D *20/10***
**U.S. Cl. 34—90** **4 Claims**

1. Hair removing apparatus for a hand held hair dryer including a housing with an air inlet opening therein, said hair removing apparatus including a body portion, a dryer connecting portion, a hair collecting portion and a hair pickup portion; said body portion including a rigid tubular member with open

ends and a substantially straight passage therethrough, said tubular member including a flange section disposed adjacent an end thereof closest to said dryer connecting portion; said dryer connecting portion including adapter means disposed adjacent one end of said tubular member and being slidable with respect thereto, said dryer connecting portion including a plurality of sidewall openings, said adapter means including stop sections disposed adjacent ends thereof to captively retain said flange section of said tubular member, said adapter means including resilient means capable of captively mating with the periphery of said air inlet opening of said dryer housing; said hair collecting portion including an air permeable flexible filter bag disposed across and within said passage through said tubular member and extending substantially the full length of said body portion, said filter bag including a rigid ring member disposed adjacent and circumscribing the opening thereof, said ring member being engageable with the end of said tubular member remote from said dryer connecting portion, means for maintaining said filter bag properly oriented with respect to said passage including filter support means disposed across said tubular member passage adjacent said dryer connecting portion; said hair pickup portion being rigidly connected directly to the end of said tubular member remote from said dryer connecting portion, said hair pickup portion including an end member separable from said tubular member, said end member having a tubular configuration adjacent to said tubular member for connection thereto and tapering to a slot configuration adjacent the free end thereof, said slot end of said end member including a soft resilient surface, whereby attaching said connecting portion of said hair removing apparatus to the air inlet opening of a hand held hair dryer which is operating and holding said hair pickup portion of said apparatus adjacent to loose hair, will draw the hair into said pickup portion and collect the hair in said collecting portion when the sidewall openings in the dryer connecting portion are covered by the tubular member.

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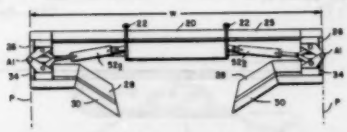
**4,479,312**

## FOLDABLE SNOW COMPACTOR WITH SIDE WINGS PIVOTABLE BEHIND CENTRAL BLADE

**Harry S. Turgeon, Lewiston, Me., assignor to Valley Engineering, Inc., Gray, Me.**

**Filed Apr. 11, 1983, Ser. No. 481,763**
**Int. Cl.³ E01C *19/22*; E02F *3/76***
**U.S. Cl. 37—219** **9 Claims**




1. A foldable snow compactor of the type adapted to be towed behind a vehicle, said compactor comprising:

a center pan having a forwardly facing front surface, a lower working edge, and laterally outwardly facing end surfaces;

a pair of wings, each having a forwardly facing front surface, a lower working edge, and a laterally inwardly facing end surface, said wings being adapted to be operatively positioned at opposite ends of said center pan, with their front surfaces and working edges providing continuing extensions of the front surface and working edge of said center pan, and with the end surfaces of said wings being in contact with respective ones of the end surfaces of said center pan;

connecting means for joining said wings to said center pan for pivotal movement about axes located rearwardly of the front surfaces of said center pan and wings;

and operating means associated with said connecting means for pivoting said wings between said operative positions and inoperative positions located rearwardly of said center pan.

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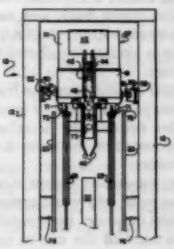
**4,479,313**

## TROUSER FINISHER WITH EXTENDED EXTERIOR DRESS POINT

**Leonard Frushtick, Denver, N.C., assignor to Leonard Automatics, Inc., Denver, N.C.**

**Filed Sep. 16, 1983, Ser. No. 532,768**
**Int. Cl.³ D06F *71/28***
**U.S. Cl. 38—42** **6 Claims**



1. A trouser presser comprising a frame, a stationary center buck mounted on the frame, heated side chests mounted on the frame on either side of the center buck and moveable between a retracted position in spaced-apart relation from the center buck and a pressing position against the center buck, said frame defining a front operator access opening forward of the center buck, a waist expander assembly mounted on the frame for receiving the torso of a pair of trousers and extension means for extending said waist expander assembly forward through the operator access opening for providing an extended exterior dress point away from heated surfaces of the side chests for operator safety and comfort; and comprising:

(a) a straight, horizontally disposed track for mounting said waist expander assembly for translation only movement of said waist expander assembly to a point outside the frame forward of the center buck and away from the side chests for dressing and removal of trousers from the waist expander and a pressing position over the center buck, for pressing the trousers;

(b) movement means mounted on the frame and operably attached to said waist expander assembly for moving said waist expander assembly on said track;

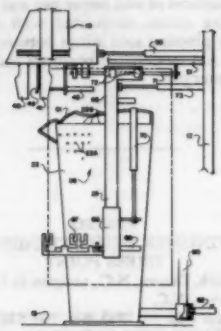
and,

(c) a pair of spaced-apart leg expanders mounted on a leg expander track carried by said frame, said pair of leg expanders mounted for alternate movement between an extended exterior dress point forward of the center buck and a pressing position on either side of the center buck.

## 4,479,314
## TROUSER FINISHER WITH INDEPENDENTLY RETRACTABLE AND EXTENDABLE WAIST AND LEG EXPANDERS

**Leonard Frushtick, Denver, N.C., assignor to Leonard Automatics, Inc., Denver, N.C.**

**Filed Sep. 16, 1983, Ser. No. 532,791**
**Int. Cl.³ D06F *71/28***
**U.S. Cl. 38—42** **3 Claims**



1. In a trouser presser having a frame, a stationary center buck mounted on the frame, side chests mounted on the frame on either side of the center buck and moveable between a retracted position in spaced-apart relation from the center buck and a pressing positon against the center buck, the improvement which comprises:

(a) a waist expander mounted on the frame and adapted to receive the torso part of a pair of trousers;

(b) a leg expander operatively detached from said waist expander and mounted on the frame for receiving the legs of a pair of trousers;

(c) waist expander movement means mounted on the frame and cooperating with said waist expander for alternately moving said waist expander horizontally between a dressing position forward of the center buck and a pressing position over the center buck and comprising an elongate rod carried by one of the frame or waist expander and extending in a direction from the rear to the front of the frame and a slide carried by the other of the frame and waist expander for mating sliding cooperation with said rod for forward and rearward movement of said waist expander relative to said frame;

(d) leg expander movement means mounted on the frame and operating independently of said waist expander movement means for alternately moving said leg expander between a dressing position forward of the center buck and a pressing position on either side of the center buck whereby said waist expander and said leg expander are independently moveable for easier adjustment and less load on moving parts of said trouser presser in order to create less noise and reduce energy consumption wherein said leg expander movement means comprises a track for mounting said leg expander for translation movement to a point outside the frame and away from the side chests.

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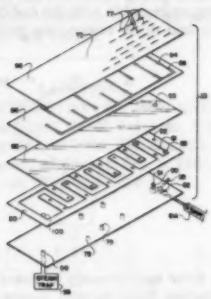
## 4,479,315
## STEAMING APPARATUS FOR A VERTICAL SIDE CHEST IN A TROUSER PRESSER

**Leonard Frushtick, Denver, N.C., assignor to Leonard Automatics, Inc., Denver, N.C.**

**Filed Sep. 16, 1983, Ser. No. 532,792**
**Int. Cl.³ D06F *71/28***
**U.S. Cl. 38—42** **12 Claims**

1. A trouser presser including a frame, a stationary center buck vertically mounted on the frame, a waist expander mounted on the frame for receiving the torso portion of a pair of trousers, and leg expanders mounted on the frame for receiving the cuffs of a pair of trousers and holding the legs of the trousers in a tensioned condition on either side of the center buck and a pair of side pressing chests being mounted on the frame, one on each side of the center buck and being moveable between a retracted position away from the center buck and a pressing position against the center buck during a pressing cycle, each of said side chests comprising:

(a) pressing means defining a pressing surface for pressing a pair of trousers against the center buck, said pressing means defining a pressing surface having a plurality of uniformly spaced-apart apertures along the length and width thereof;



(b) heating means for heating the pressing surface so as to permit heat transfer from the pressing surface to the trousers while each side chest is in its pressing position against the center buck; and

(c) steam supply means for supplying steam to the apertures on the pressing surface for spray application of a uniform quantity of steam to the trousers at substantially right angles thereto while said pressing surface is spaced-apart from the center buck before commencement of the pressing cycle

whereby a uniform application of steam is made to the torso and leg portions of the trousers followed by a uniform application of heat from the pressing surface to the torso and leg portions of the trousers resulting in uniform drying of the trousers.

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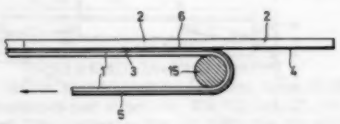
## 4,479,316
## LABEL STRIP

**Gerhard Wippern, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.**

**Filed Feb. 4, 1981, Ser. No. 231,339**
**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005625**
**Int. Cl.³ B32B *3/16*; G09F *3/08***
**U.S. Cl. 40—2 R** **10 Claims**




1. Label strip comprising a carrier strip and labels adhering in a series to said carrier strip by means of an adhesive layer for processing in label printing or dispensing apparatuses, in which the carrier strip is drawn by a pull-off device progressively around a deflection device where the labels are released from the carrier strip, characterized in that the labels (2) are made

from a material selected from the group consisting of a cardboard having a weight of 100 to 150 g/m$^2$ and a plastic film as stiff as cardboard and that the side (4) of the labels (2) facing the carrier strip (1) is adhesive-repellent and the side (5) of the carrier strip (1) facing the labels (2) has an adhesive-retaining surface, the adhesive repellent side of the labels facing the carrier strip being (a) siliconized or (b) smoothed so that the adhesive-retaining surface of the carrier strip is released from the labels (2) as the carrier strip is drawn around the pull-off device.

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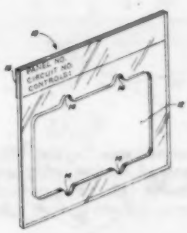
**4,479,317**

## ELECTRICAL CIRCUIT MARKING IDENTIFICATION PLATE

**Ivan E. Hanna, 2538 E. Third St., Tucson, Ariz. 85716**

**Filed Sep. 27, 1982, Ser. No. 424,529**
**Int. Cl.$^3$ A44C *3/00*; G09F *3/18***
**U.S. Cl. 40—2 R** **7 Claims**



1. In an electrical wall outlet box having electrical apparatus contained therein and its face cover plate, an improved electrical circuit marking identification plate for labeling adapted to be placed between the electrical wall outlet box and the face cover plate, the identification plate comprising:

a flat transparent plate having four sides and larger in size than the face cover plate, at least one of said sides extending substantially beyond the face cover plate;

a first opening in said flat transparent plate adapted to permit passage of electrical apparatus contained in the electrical wall outlet therethrough;

a second opening formed in said flat transparent plate to permit passage of screws from the face cover plate to the electrical wall outlet box; and

an adhesive coating placed upon the side of the flat transparent plate extending beyond the face cover plate, said adhesive coating to receive and secure an electrical circuit identification label.

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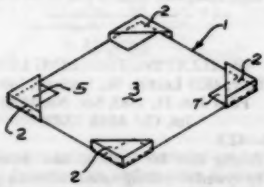
**4,479,318**

## PAPERBOARD PICTURE FRAME OR THE LIKE SUPPORT AND DISPLAY

**Dennis E. Russell, Jonesboro, Ark., assignor to Alton Packaging Corporation, Alton, Ill.**

**Filed Dec. 7, 1982, Ser. No. 447,540**
**Int. Cl.$^3$ A47G *1/06*; G09F *1/12***
**U.S. Cl. 40—154** **17 Claims**



1. A paperboard picture frame or the like support, comprising a base member means useful for supporting a frame or the like, a series of integral corner strap means integrally connecting proximate select corners of the base member means, each corner strap means being formed of foldably connected sections, each corner strap means formed of foldably connected sections, each corner strap means formed of a series of said extending sections integrally linked together with only a first section integrally foldably connecting with an approximate one side corner edge of the base member means, and with said corner strap means when folded over providing for an embracement of the proximate corner of the positioned picture frame or the like, whereby the final extending section of the corner strap means inserts beneath at least the emplaced frame, and its supporting base member means and with the connected corner strap means thereby securely retaining the contiguous corner of the frame to its support.

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**4,479,319**

## AN ADHESIVE SIGN AND METHOD OF MAKING

**Egon Erlich, 701 Ocean Ave., #10, Santa Monica, Calif. 90402**

**Continuation-in-part of Ser. No. 266,913, May 26, 1981, Pat. No. 4,372,070. This application Jan. 31, 1983, Ser. No. 462,518**
**The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.**
**Int. Cl.$^3$ G09F *7/16***
**U.S. Cl. 40—595** **10 Claims**

1. An adhesive sign comprising:

a material having a plurality of characters representing a sign cut into the material, said characters remaining in the material with the waste core pieces of certain characters removed;

an adhesive on the bottom of said material, said adhesive on the material limited only to the areas forming said characters;

a bottom covering sheet means on the bottom of said material coextensive with the surface area of said material.

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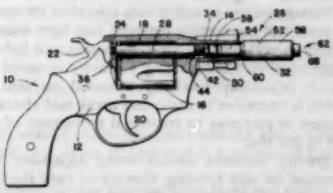
**4,479,320**

## CYLINDER LOCK FOR REVOLVERS

**Wilbur L. Fix, 0258 Comanchero Trail, New Castle, Colo. 81647**

**Filed Sep. 29, 1982, Ser. No. 427,964**
**Int. Cl.$^3$ F41C *27/00***
**U.S. Cl. 42—1 LP** **10 Claims**
**MICROFICHE APPENDIX INCLUDED**
**(08171984 Microfiche, Pages)**



1. For use with a revolver of the type having a barrel, a multi-chambered cylinder mounted for rotation within an opening in a frame mounting the barrel and a trigger mecha-

nism operative upon actuation to bring the cylinder chambers into axial alignment one at a time with the barrel bore, a cylinder lock assembly for preventing rotation of the cylinder which comprises: a lock rod sized to loosely fit inside the barrel bore and being of a length less than the combined lengths of said barrel and the chamber aligned therewith but greater than the length of said chamber alone; a keeper in the form of a frictionally-held plug insertable into the barrel bore and effective when so positioned to hold the lock rod therein, said keeper having a rear end proximate the lock rod, a front end carrying a first connecting means engageable by a tool for extracting same, and an axial opening extending between the ends thereof; and an extractor having a rear end sized for insertion into the barrel bore and a front end, second connecting means carried by said rear end releasably connectable to said first connecting means on the front end of the keeper for placing the latter in the barrel bore and retrieving same therefrom, said extractor also having an axial opening therethrough and a pin mounted within said opening for reciprocal movement relative thereto between an extended and a retracted position, said pin having a front end and a rear end and an overall length greater than the combined lengths of the keeper and extractor when connected together, said pin in retracted position with the extractor and keeper thus interconnected extending all the way through the latter and beyond the rear end thereof into position for engagement with the near end of the lock rod when the remote end thereof is seated against the portion of the frame behind the cylinder after having passed through said aligned chamber thereof, and the front end of said pin in extended position brought about by deeper insertion of said interconnected extractor and keeper into the barrel bore with said pin contacting the lock rod providing an observer with a visual indication that said rod is thus seated.

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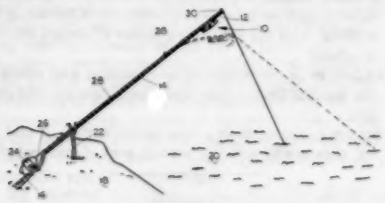
**4,479,321**
**NIGHT FISHING LIGHT**
**Robert F. Welstead, 1003 3rd Ave., Plattsmouth, Nebr. 68048**
**Filed Nov. 15, 1982, Ser. No. 441,612**
**Int. Cl.³ A01K *97/12***
**U.S. Cl. 43—17** **1 Claim**



1. A signaling device for an elongated fishing rod having a handle at one end and an opposite free end, comprising

a housing,

means for mounting said housing on said rod adjacent the free end thereof for movement therewith,

an electrically actuated light source visibly mounted on said housing,

said housing being adapted to receive a battery therein and including electric circuit means operative for establishing an electrical connection between said light source and a battery in said housing for illuminating said light source,

said electrical circuit including a gravity actuated mercury switch adjustably rotatably mounted on said housing which is operative to make and break said electrical connection in response to rotational movement of said free end of the rod,

said gravity actuated switch being adjustably rotatably mounted on said housing, thereby to vary the degree of rotational movement of the rod which is operative to make said electrical connection,

a handle mounted externally of said housing and connected to said mercury switch for rotational movement therewith whereby said mercury switch may be rotatably adjusted by said handle,

said housing comprising an elongated cylindrical body having forward and rearward ends and opposite side walls, said light source being replaceably mounted adjacent the forward end, and

a pivot shaft extended through one side wall, said mercury switch and handle both being connected to said pivot shaft and extended generally perpendicularly therefrom.

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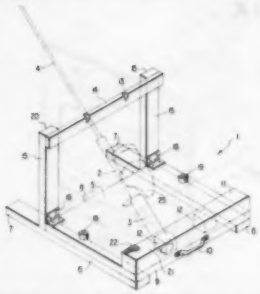
**4,479,322**
**FISHING ROD HOLDER/CARRIER**
**Richard A. Koppel, 110 Russell Ave., Douglassville, Pa. 19518**
**Filed Dec. 29, 1982, Ser. No. 454,348**
**Int. Cl.³ A01K *97/10***
**U.S. Cl. 43—21.2** **16 Claims**



1. A holder/carrier, foldable into either an open or a closed position for respectively holding or carrying a fishing rod having at least a handle portion and a staff portion, comprising:

a. a base means for preparing bait;

b. extension means, mounted to the base means and extended forwardly thereof, for preventing tip-over of the base means;

c. upstanding members, mounted on and near a front edge of the base means;

d. means, mounted on said extension means and cooperating with said upstanding members, for keeping the upstanding members upright and for maintaining the holder/carrier in its open position for holding the fishing rod;

e. means, mounted near a rear edge of the base means, for locking the upstanding members folded down fnd for maintaining the holder/carrier in its closed position for carrying the fishing rod; and

f. a handle means, mounted near the rear edge of the base means, for transporting the holder/carrier in its closed position in a briefcase-like manner;

said extension means include substantially parallel skid members, mounted on the underside of and extending along at least a portion of the length of the base means, for elevating the bottom of the base means slightly off the surface upon which the holder/carrier is placed so that the fishing rod is kept clear and entirely out of dirt, sand and water.

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**4,479,323**
**OSCILLATING TROLLING LURE**
**Roland E. Barr, 4825 Leaside St., Saginaw, Mich. 48603**
**Filed Jan. 31, 1983, Ser. No. 462,317**
**Int. Cl.³ A01K *85/04***
**U.S. Cl. 43—42.5** **7 Claims**

1. In a fishing lure for salmon, lake trout, and the like adapted to be towed at trolling speeds behind a power boat; the product comprising:

a. a thin, lightweight, light reflecting, elongate, plate-like

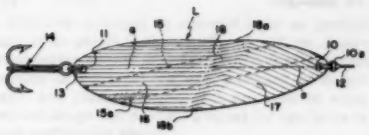
body fashioned of lightweight material and having a generally elliptical upper and lower surface which includes;

a. a frontal portion having means for attachment of a line; a trailing rear portion having means attaching a treble hook system or the like; and a midportion interjacent the frontal portion and trailing portion;

b. the means for attachment of a line and attaching the hook system defining a centrally offset longitudinal axis;

c. the trailing portion being substantially flat and lying substantially in a horizontal plane;

d. the interjacent portion comprising a vertically sloping four sided wall having an upper side extending crosswisely at an oblique angle to the offset longitudinal axis of the body, the wall having a downwardly and rearwardly inclined side edge of greater extent at one end, and downwardly and rearwardly inclined side edge of lesser extent at the other end;



e. the frontal portion being a plate-like section lying in a horizontally tipped plane, with the lowermost side edge of the frontal portion being vertically upwardly spaced from the plane in which the said trailing portion substantially lies;

f. The said centrally offset longitudinal axis separating the body into a portion of greater width and a portion of narrower width on opposite sides of said axis, and the side edge of the four sided wall of lesser extent comprising a side edge portion of the body portion which is of greater width;

g. the shape defined being such that the trailing portion of the lure swings in an oscillating vertically concave arc with respect to a horizontal plane less than about 180°, generally about its means for attachment of a line, while being towed at trolling speeds.

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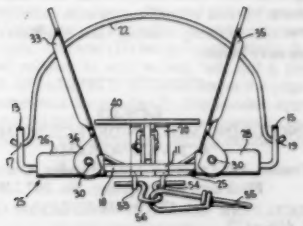
**4,479,324**

## ANIMAL TRAP WITH IMPROVED IMMUNITY TO FALSE ACTUATION

**William E. Askins, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.**

**Filed Jan. 20, 1983, Ser. No. 459,592**
**Int. Cl.³ A01M *23/26***
**U.S. Cl. 43—92** **18 Claims**



1. A trap comprising:

a frame;

first and second jaws pivotally mounted on said frame for movement between set and sprung positions, said set position being characterized by a relatively large angular spacing between said jaws, said sprung position being characterized by a substantially zero angle between said jaws;

spring loaded actuator means being outwardly pivoted movable between open and closed positions, for continually biasing said jaws toward said sprung position;

setting means for defining said relatively large angular spacing by holding said jaws in said set position against the urging of said actuator means;

trigger means for selectively releasing said setting means to permit the jaws to be snapped to said sprung position by said actuator means; and

stop means secure to the said frame for preventing the angular spacing between said jaws from exceeding the spacing defined by said setting means.

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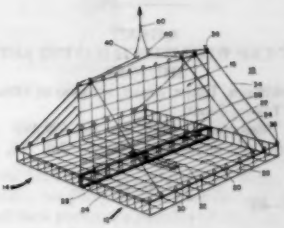
**4,479,325**

## COLLAPSIBLE CRAB TRAP

**John A. Jakimas, 671 Forest St., Kearny, N.J. 07032, assignor to John A. Jakimas and Donald Jakimas, both of Kearny, N.J.**

**Filed Aug. 23, 1983, Ser. No. 525,828**
**Int. Cl.³ A01K *69/10***
**U.S. Cl. 43—105** **12 Claims**



1. A trap assembly, which comprises:

a first wall member of a netted material

basket-shaped outer wall members formed of a semi-rigid netted material hingeably mounted to and on either side of said first wall member between an open position and a closed position and defining an entrapment zone with said first wall member in said closed position; and

means for effecting hingeable movement of said outer wall members from said open position to said closed position.

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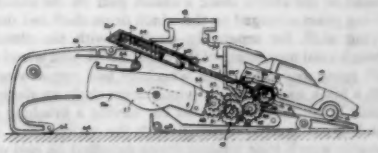
**4,479,326**

## SPARKING TOY VEHICLE AND LAUNCHER

**Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.**

**Filed Mar. 24, 1983, Ser. No. 478,237**
**Int. Cl.³ A63H *33/36***
**U.S. Cl. 446—23** **8 Claims**



1. A toy vehicle-projecting gun assembly which can be held in the hand of a player and pointed in a manner of a gun comprising:

A. a vehicle having axle-mounted front and rear wheels, a drive gear mounted in the rear axle and an energysaving flywheel mounted for rotation within the body of the vehicle and operatively coupled to the drive gear to func-

tion as the vehicle motor, whereby when the drive gear is rotated, the flywheel is caused to turn to store energy to power the vehicle;

B. a gun having a power chamber, an inclined ramp extending from the front end of the chamber and including latching means to retain the vehicle thereon with its rear wheels raised above the ramp and free to turn, and a stock extending from the rear end of the chamber;

C. a power trigger disposed on the underside of the stock which can be reciprocated by the trigger finger of the hand of a player grasping the stock;

D. a gear train disposed in said chamber to operatively couple the trigger to the drive gear and to convert the reciprocating action of the trigger into rotary motion to rotate the drive gear of the latched vehicle and thereby turn the flywheel to store energy;

E. a firing button disposed on the upper side of the stock which can be depressed by another finger of the hand of the player; and

F. an unlatching mechanism operated by the firing button to release the vehicle from the latching means, whereby when the rotating flywheel has gained momentum and the firing button is pressed, the vehicle then shoots down the tamp to travel in a direction determined by how the player's hand points the gun assembly.

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**4,479,327**

## ELECTRIC CAR WITH WINCH HAVING AUTOMATIC SHUTOFF

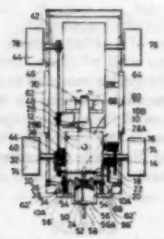
**Kakuichi Wakimura, Tokyo, Japan, assignor to Mitsuwa Kogyo Co., Ltd., Tokyo, Japan**

**Filed Nov. 5, 1982, Ser. No. 439,399**

**Claims priority, application Japan, Jul. 10, 1982, 57-104756[U]**

**Int. Cl.³ A63H *17/12***

**U.S. Cl. 446—427** **3 Claims**



1. A toy car with a winch mechanism, which comprises a clutch shaft associated with a driving shaft of a motor, said clutch shaft being axially movable through an oscillating rod; said oscillating rod including electrical contact means to a source of power for energizing said motor; a winch drum shaft and a wheel driving shaft supported on a car frame and in parallel to the clutch shaft; a clutch gear on the clutch shaft; driving gears arranged on the winch drum shaft and the wheel driving shaft for separately meshing with the clutch gear through axial movement of the clutch shaft, said wheel driving shaft being associated with wheels of said car; a winch rope with a hook secured to the winch drum shaft; an electric conductor brush mounted in said car having a brushing surface which is resiliently contacted with the winch drum shaft; a movable winch rope guiding frame mounted on said car, said frame being adapted to move in a forward and backward direction and move said brush upon the backward movement, said electric conductor brush and said winch drum shaft constituting a switch means being released upon said rope guiding frame moving said brush for discontinuing the winch operation; said guiding frame having an opening near its center for guiding said winch rope therethrough; said oscillating rod being movable to a position with its contact means for starting said motor and rotating said winch drum shaft to wind said winch rope thereon until said winch hook engages said rope guiding frame causing it to move in a backward direction; whereby said switch means is released through the winch rope on the rope guiding frame for discontinuing the hoisting operation of the winch, said switch being provided with a switching contact to the electric conductor brush and the winch drum shaft.

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**4,479,328**

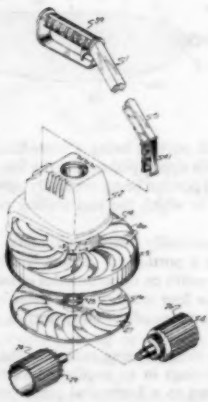
## PUSH-PULL TOY WITH VANE MEMBERS ROTATING IN DIFFERING ROTATIONAL RELATIONSHIP

**Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.**

**Filed Sep. 27, 1982, Ser. No. 423,699**

**Int. Cl.³ A63H *33/00***

**U.S. Cl. 446—237** **11 Claims**



1. A push-pull toy comprising a housing member, support means fixed to and extending from said housing; a pair of spaced parallel facing substantially similarly sized vane members rotatably mounted on said support means, at least a portion of said vane members disposed relative to said housing so as to be visible therefrom with aperture means in at least one of said vane members to permit visual discernment therethrough of the rotational movement of the other; wheel means rotatably supported to said housing; a propelling member for said housing; and gear means connecting said wheel means to each of said vane members to cause said vane members to rotate in differing rotational relationship when said housing is placed into motion by said propelling member whereby the visible portion of said differing rotating vane members creates a visibly decorative pattern.

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**4,479,329**

## TOY INCLUDING MOTION-DETECTING MEANS FOR ACTIVATING SAME

**Jacob Fraden, 170 Lakeview Ave., Hamden, Conn. 06514**

**Filed Sep. 30, 1981, Ser. No. 307,235**

**Int. Cl.³ A63H *33/26***

**U.S. Cl. 446—175** **15 Claims**

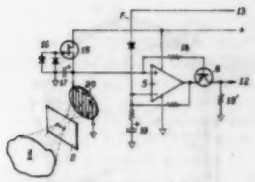
1. A toy, comprising

a base member;

motion-detecting means mounted on said base member, said motion-detecting means being constructed and arranged to detect at least one of the presence of a motion of an object in the vicinity of the toy and the absence of a moving object in the vicinity of the toy;

action-performing means mounted on said base member for cooperating with said motion-detecting means; and

electrical means connecting said motion-detecting means and said action-producing means whereby the latter is operated in response to the detection by said motion-detecting means, said motion-detecting means including



an objective arranged to transmit light to establish an image of an object in the vicinity of said toy, image-distorting means located after said objective as considered in direction of light passage and arranged to distort the image, and photosensing means arranged to sense the distorted image and produce a signal for operation of said action-performing means.

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**4,479,330**

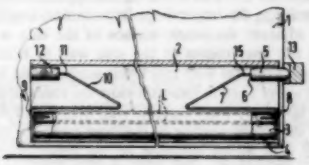
## MECHANICALLY CONTROLLED SEALING RAIL FOR DOOR LEAF

**Luis C. Müller, Muntaner, 184-2°, Barcelona-36, Spain**

**Filed Oct. 6, 1983, Ser. No. 539,554**

**Int. Cl.³ E06B *7/20***

**U.S. Cl. 49—303** **9 Claims**



1. A mechanically controlled sealing rail for a door leaf, comprising a pair of spring members (7, 10) having bight portions pointing toward the interior of the door, a sealing rail (3) adapted to extend across the bottom of a door leaf and having longitudinal bores (L) at least in opposite ends close to the upper side of the sealing rail (3), said spring members having hook shaped (8, 9) lower ends hung into said longitudinal bores (L) at opposite ends of said sealing rail (3), one of said spring members (10) having an upper free end (11) adapted to be attached to the door leaf (1), the other of said spring members (7) having an upper free end (15) being longitudinally displaceable in parallel relation to said sealing rail, and a pivotable angle lever (13, 13') adapted to be connected at the edge of the door leaf adjacent said longitudinally displaceable upper free end (15) and connected to urge the same inwardly from the edge of the door leaf and move said sealing rail downwardly.

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**4,479,331**

## VINYL CLAD WOOD CONSTRUCTION REPLACEMENT SASH WINDOWS

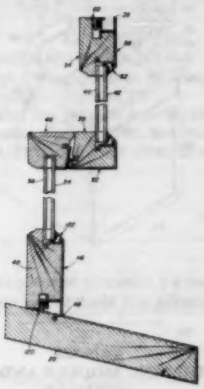
**Ugo Bertolami, Somerville, and Salvatore Bertolami, Burlington, both of Mass., assignors to J. B. Sash & Door Co. Inc., Somerville, Mass.**

**Filed Jan. 15, 1982, Ser. No. 339,289**

**Int. Cl.³ E04B *1/04***

**U.S. Cl. 49—404** **10 Claims**

1. A window assemblage comprising: an upper window sash and a lower window sash; said upper window sash including a top rail, a pair of upper stiles, and a forward meeting rail; said lower window sash including a bottom rail, a pair of lower stiles, and a rearward meeting rail; upper and lower glass panes carried by the upper and lower window sashes; said top rail, said pair of upper stiles, and said forward meeting rail, and said bottom rail, said pair of lower stiles, and said rearward meeting rail being of wood construction with selectively milled kerfs and exterior cladding in the form of a plurality of vinyl main extrusions and vinyl bead extrusions; said plurality of said main extrusions, in cross section, integrally including face portions



and peripheral hook portions; said plurality of bead extrusions, in cross section, integrally including arcuate portions, oblique portions, and hook portions; a plurality of said hook portions of said bead extrusions being interconnected with a plurality of said hook portions of said main extrusions; and a plurality of said arcuate portions being flexed between edges of said glass panes and portions of said main extrusions, said plurality of main extrusions including upwardly and downwardly directed splines that are operative when cut obliquely to establish weather tight seals in association with non-plumb frames.

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**4,479,332**

## LENS BLOCKER AND METHOD

**Theodore J. Stern, Woodland Hills, Calif., and Larry A. Beachler, Vincennes, Ind., assignors to AIT Industries, Inc., Schaumburg, Ill.**

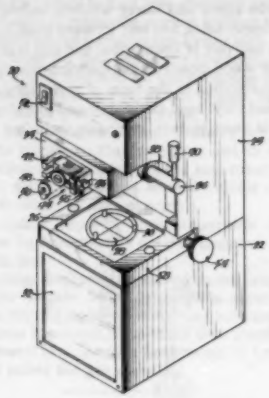
**Filed Sep. 16, 1982, Ser. No. 418,750**

**Int. Cl.³ B24B *9/14, 1/00, 13/00***

**U.S. Cl. 51—277** **16 Claims**

1. An improved lens blocker for bringing an adhesive bearing lens block into contact with a lens to adhesively affix said block to the lens, comprising a support for the lens; a chuck for said block; means for releasably securing said block to said chuck; and means for moving said support and chuck relative to each other to move the same toward each other to bring said block into contact with and to adhesively affix said block to the

lens, and then away from each other to accommodate release of said block from said chuck, the improvement characterized



in that said means for releasably securing comprises means for magnetically securing said block to said chuck.

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4,479,333

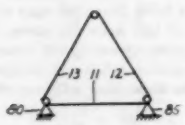
## FOLDED BUILDING MODULE AND METHOD OF ASSEMBLY

John H. Hendrich, 4851 Wolf Rd., Erie, Pa. 16505

Continuation of Ser. No. 17,436, Mar. 5, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 299,816

Int. Cl.³ E04B *1/346*

U.S. Cl. 52—70 28 Claims




1. An improved building module of the type having a plurality of structural elements pivotably connected and folded together for movement to a building site for erection, comprising:

(a) a floor element having first and second ends and being adapted for placement on horizontal support means;

(b) first and second roof elements each having first and second ends;

(c) first pivot means for pivotably connecting said floor first end and said first roof element first end;

(d) second pivot means for pivotably connecting said first roof element second end to said second roof element first end; said second roof element having its second end free and being pivotable about said second pivot means from a first folded position substantially parallel to said floor element, and said first roof element being pivotable about said first pivot means, to form in combination an angled roof component which is vertically supported in part by said first pivot means; and

(e) means for connecting said second roof element to said floor element second end to provide a stable, three-member structure, whereby said floor element is adapted to rest on the horizontal support means so as to provide the entire vertical support for said first and second roof elements and also act as a tensile member to restrain said first roof element first end and said second roof element second end from lateral separation.

4,479,334

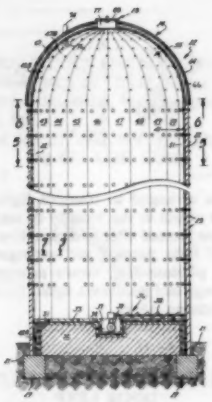
## LINER FOR TOWER SILO AND METHOD OF INSTALLING SAME

John T. Goode, 11731-99th Place North, Osseo, Minn. 55369

Filed Dec. 17, 1981, Ser. No. 331,535

Int. Cl.³ E04H *7/00*

U.S. Cl. 52—197 55 Claims



1. An apparatus for converting a conventional tower silo including an upright side wall having an inside surface surrounding a chamber for storing material, an upper end, and a lower end anchored to the ground, a roof mounted on the upper end of the silo wall covering the upper end of the chamber comprising: air impervious liner means located in said chamber adjacent the inside surface of the side wall, means attaching the liner means to the side wall to hold the liner means in engagement with said inside surface, said liner means having an upper portion located below the roof, support means extended upwardly from the side wall below said roof, means attaching the upper portion of the liner means to the support means, air vent means mounted on the upper portion of the liner means operable to allow air to flow into and out of the chamber to substantially equalize the inside and outside air pressure, and floor means at the lower end of the side wall, said floor means having means to accommodate a bottom material unloading machine.

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4,479,335

## INTERIOR WALL SYSTEM

Frank W. Roberts, Midvale; Richard A. Roberts; W. Calvin Roberts, both of Holladay; Jack A. Nipko, Draper; Clark S. Roberts, Holladay, and Hal R. Hudson, Orem, all of Utah, assignors to Western Sun, Inc., Salt Lake City, Utah

Division of Ser. No. 278,951, Jun. 30, 1981,. This application Aug. 8, 1983, Ser. No. 521,153

Int. Cl.³ E06B *3/28*

U.S. Cl. 52—205 9 Claims

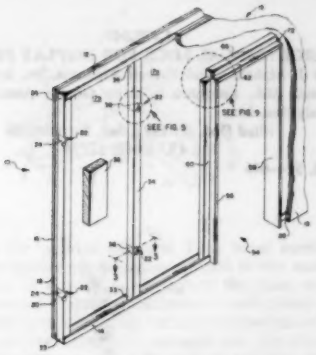
1. A door frame for installation into a previously installed interior wall system having spaced apart, opposed wall panel members, the door frame comprising:

a first jamb member terminating at the top of said door frame and having a first spacing member attached to said first jamb member, said first spacing member being configured so as to permit insertion of the first spacing member into the space between the opposed wall panel members of the previously installed interior wall system;

a lintel member having a second spacing member attached to said lintel member, said second spacing member being configured so as to permit insertion of the second spacing member into the space between the opposed wall panel

members of the previously installed interior wall system; and

a second jamb member terminating at the top of said door frame and having a third spacing member attached to said second jamb member, said third spacing member being configured so as to permit insertion of the third spacing member into the space between the opposed wall panel



members of the previously installed interior wall system, and one end of said lintel member being demountably attached to said first jamb member at the top thereof and the other end of said lintel member being demountably attached to said second jamb member at the top thereof, said first and second jamb members and said lintel member being demountable from the wall panel members without causing significant damage to the wall panel members.

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**4,479,336**

## CONCRETE COVER FOR HIGH PRESSURE VESSELS

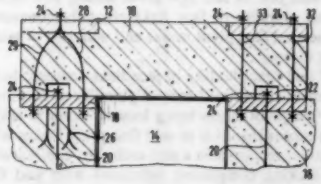
**Josef Schoening, Hambruecken, and Hans-Georg Schwiers, Ketsch, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH., Cologne, Fed. Rep. of Germany**

**Filed Dec. 3, 1981, Ser. No. 327,036**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048592**

**Int. Cl.³ E04C *3/10***

**U.S. Cl. 52—223 R** **12 Claims**



1. A removable stressed concrete cover for large openings in prestressed concrete pressure vessels comprising:

an anchoring ring surrounding the rim area of the opening;

a plurality of axial stressing cables extending from the prestressed concrete pressure vessel and through said anchoring ring;

an anchoring bolt securing the end of each of said axial stressing cables to said anchoring ring;

a concrete cover member;

a plurality of cover stressing cables extending through said concrete cover member through said anchoring ring and into the prestressed concrete pressure vessel, and at least two of said cover stressing cables being joined at one end and secured by a single anchoring bolt;

means for releasably securing said cover stressing cables to said concrete cover member whereby releasing said cover stressing cables does not affect said axial stressing cables, and a retaining ring on the outer rim of the upper part of said concrete cover member wherein said cover stressing cables extend through said retaining ring and are arranged in pitch circles alternatingly from an inner pitch circle to an outer pitch circle about the central axis of said retaining ring.

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**4,479,337**

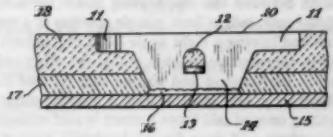
## REFRACTORY ANCHOR

**Michael S. Crowley, Chicago Heights, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Continuation of Ser. No. 140,174, Apr. 14, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,181**

**Int. Cl.³ E04B *1/24*; E04C *2/04***

**U.S. Cl. 52—378** **5 Claims**



1. A composite structure comprised of a metal surface, a monolithic refractory for providing thermal protection to said surface, and a plurality of metal anchors welded to said surface in spaced apart non-touching relationship to each other for providing both erosion protection and anchorage for said monolithic refractory applied to said surface, each of said anchors being formed from a metal strip having its width substantially equal to the thickness of the applied refractory whereby the anchors extend to the exposed surface of the refractory and the length of each anchor being several times its width and each anchor having cut away portions at each end on the side welded to said metal surface whereby there is provided at each end of said anchor an extending arm, said extending arms being bent in opposite directions to the approximate shape of the letter S and together with the intermediate portion of said anchor providing an erosion resistant barrier for the protection of said refractory and the cut away portions adjacent said arms providing room for said refractory to be deposited between said arms and said surface securely anchoring the refractory to the metal surface.

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**4,479,338**

## BUILDING ELEMENTS AND METHOD OF CONSTRUCTING A BUILDING

**Gordon M. Robertson, 9 Flint Rd., Marandellas, South Africa**

**Filed Nov. 9, 1981, Ser. No. 319,116**

**Claims priority, application United Kingdom, Oct. 2, 1981, 8129872**

**Int. Cl.³ E04B *2/40***

**U.S. Cl. 52—426** **5 Claims**

1. A building unit, comprising:

two molded cavity wall portions having confronting inner surfaces, each cavity wall portion having enlarged ends having a thickness greater than the thickness of its central

portion and one or more rebates formed along each of two opposed side edges onto the outer surface of the respective cavity wall portion, each cavity wall portion having integral connecting means including a longitudinally extending and embedded wire with its end freely extending in corresponding ones of each of said rebates along the side edges of the portions, the freely extending end of the embedded wire of the integral connecting means of a first building unit is twisted and bent around the freely extending end of the wire of the integral connecting means of a second building unit to mechanically connect the two building units together; and spacing and interconnecting means transversely extending between the inner surfaces of said two molded portions intermediate said opposed side edges, said spacing and interconnecting means including at least one loop integrally formed with said longitudinally extending embedded wire projecting inwardly from the inside surfaces of respective ones of said portions intermediate said side edges thereof, said spacing and interconnecting means including at least one elongated tie having a length that is selected to match the dimension defined between the confronting inside surfaces of said building unit, said at least one tie consists of a rod having a first end having a right angle bend that is bent back on itself in intermediate its ends so that the other end thereof overlies its first end and to one side thereof forming a resilient loop, said resilient loop is inserted around corresponding ones of said loops formed in said embedded wire intermediate said sides for mechanically joining the portions together.

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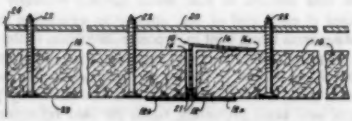
4,479,339

## COVER MEMBER FOR AND METHOD OF INSTALLING INSULATION BOARDS

Carl A. Kroh, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Apr. 7, 1982, Ser. No. 366,435
Int. Cl.[3] E04D *1/36;* E04B *1/82*
U.S. Cl. 52—468 8 Claims



1. A suspended ceiling consisting essentially of
spaced parallel purlins supported above an open space,
adjacently lying insulation boards having exposed field areas secured to said purlins, said insulation boards being oriented so that their longitudinal axes are perpendicular to the longitudinal axes of said purlins,
fasteners penetrating said insulation boards and said purlins, said fasteners being located in the exposed field areas of said insulation boards,
cover members inserted between said adjacently lying insulation boards and away from said fasteners, said cover members consisting essentially of:
a first elongated strip of stiff material;
a web of stiff material integrally connected to said first elongated strip and extending substantially vertically upwardly along the longitudinal center line of said first elongated strip, and terminating in an upper edge, and
a second strip of stiff material integrally connected along said upper edge of said vertically extending web, said second strip extending in overlying relation in one direction only with respect to said first elongated strip, said second strip further being inclined at an acute angle with respect to said vertically extending web and having a portion which is spaced from said first elongated strip by a predetermined distance, said distance being less than the height of said web,
each of said cover members being secured along one edge of one of said insulation boards.

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4,479,340

## QUICK MANUAL LOCK FOR DISPLAY FRAMES

Everett J. Alphonse, and Everett Alphonse, Sr., both of Camp Springs, Md., assignors to John Goudie Associates, Inc., Brandywine, Md.

Filed Dec. 28, 1982, Ser. No. 454,096
Int. Cl.[3] E04H *12/18*
U.S. Cl. 52—646 20 Claims

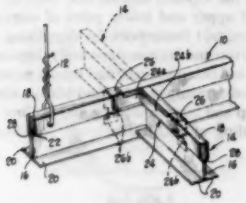
1. A collapsible, articulated structural section which is movable between a stable erect configuration and a collapsed configuration, said structure comprising:
a first plurality of pivot means disposed to be spaced from each other and generally in a first plane in said erect configuration, and to be substantially adjacent each other in said collapsed configuration; a second plurality of pivot means disposed to be spaced from each other and generally in a second plane in said erect configuration and to be substantially adjacent each other in said collapsed configuration; a plurality of pivotally interconnected side links for connecting said first plurality of pivot means with said second plurality of pivot means, each of said side links being connected with one of said first plurality of pivot means and one of said second plurality of pivot means; first and second face pivot means; and a first and a second plurality of face links, each of said first plurality of face links pivotally connected with said first face pivot means and with one of said first pivot means, and each of said second plurality of face links pivotally connected with said second face pivot means and with one of said second pivot means;
each of said first plurality of face links crossing, but unconnected to one of said second plurality of face links; said first face pivot means being located closer to said second pivot means than it is to said first pivot means when said structural section is in a said collapsed configuration; and
a first locking component associated with said first face pivot means, and a second locking component associated with said second face pivot means, said first and second locking components comprising means, upon manual actuation, for holding said first and second face pivot means adjacent each other and to thereby hold said structural section in said stable erect configuration; and
wherein said first locking component comprises means defining a through-extending opening in said first face pivot means, including a linear cam; and wherein said second locking component comprises a cam follower extending outwardly from said second face pivot means toward said first face pivot means and having a cam portion thereof cooperating with said linear cam to flex and move from a non-locking position to a locking position.

4,479,341

## CLIPS FOR T-BAR GRID CEILING ARRANGEMENT

Jerome T. Schuplin, Parma Heights, Ohio, assignor to Fastway Fasteners, Inc., Lorain, Ohio

Filed Apr. 2, 1982, Ser. No. 364,784
Int. Cl.³ E04B 5/52
U.S. Cl. 52—665 13 Claims



1. A clip for securing two grid T-bar beam members in generally juxtaposed perpendicular relation to one another in the formation of a ceiling grid, each of the beam members being of inverted T-shaped configuration comprising an enlarged head portion, a generally vertical web portion and a pair of flange portions oppositely arranged and extending outwardly with respect to the web portion, said clip being of generally L-shape configuration in plan and having resilient clasp portions generally adjacent the distal ends of the legs of the L-configuration, each said clasp portion being of generally vertically oriented inverted U-shaped configuration in end elevation and having a tongue projecting diagonally inwardly and upwardly relative to the inverted U-shaped clasp configuration, said clasp portions being adapted to be forced downwardly into snap fastened, generally snug relation with the head portion of the respective beam member to secure the beam members in generally perpendicular juxtaposed relationship.

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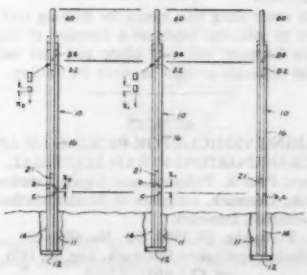
4,479,342

## POST FRAME BUILDING AND METHOD OF CONSTRUCTING THE SAME

George F. Eberle, 414 Killearn La., St. Louis, Mo. 63141

Filed Sep. 29, 1982, Ser. No. 427,686
Int. Cl.³ E04B 1/00
U.S. Cl. 52—742 10 Claims



1. A method of constructing a post frame building, said method comprising: setting a series of lower column sections into the ground in an upright position, each lower section being configured to mate at its upper end with an upper column section to form a column, each upper column section having a bearing surface at its upper end and the distance between the bearing surfaces and the lower ends of all of the upper column sections being equal, each lower section having a first reference thereon and the distance between the first references and the upper ends of all of the lower sections being equal; after the lower sections are set into the ground, marking a second reference on all of the lower sections, with the second references for all of the lower sections being at the same elevation; installing a leveling block against the bearing surface at the upper end of each upper section, the length of the block being determined by the distance between the two reference marks on the lower section to which the upper section is to be joined and being such that when the upper and lower sections are joined, the upper surface of the leveling block will be at the same elevation as the upper surfaces of the leveling blocks for other columns, whereby the leveling blocks compensate for variances in elevation of the lower column sections; joining the upper column sections to their respective lower column sections to form columns; and installing the roof structure on the columns such that it is supported on the upper surfaces of the leveling blocks.

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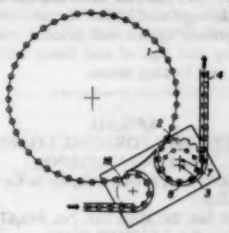
4,479,343

## DEVICE FOR FEEDING-IN AND MOVING-ON CONTAINERS TO AND FROM A ROTARY CAPPING UNIT

Franco Tincati, Via Anna Frank 7, Parma, Italy (43100)

Filed Apr. 29, 1982, Ser. No. 373,047
Claims priority, application Italy, May 6, 1981, 42506 A/81
Int. Cl.³ B65B 7/28; B67B 3/00
U.S. Cl. 53—287 5 Claims



1. Apparatus for feeding containers to a rotary capping unit and removing the containers therefrom, comprising first and second conveyors, a rotary carrier wheel, said wheel being rotatable about a fixed axis lying parallel with and offset from the axis of rotation of the capping unit and serving to take containers from said first conveyor, draw them through a path describing a circumferential arc, and deposit them on said second conveyor, said wheel being disposed in such a way that said path achieves concurrence with the pitch circumference established by rotation of the capping unit; and means for driving said rotary carrier and capping unit in substantially identical tangential speeds.

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4,479,344

## EXPANDERS FOR THE FILLING OF SACKS AND BAGS

Desmond F. Edwards, Nassau, The Bahamas, assignor to Codel International Ltd., Nassau, The Bahamas

Filed Mar. 31, 1982, Ser. No. 363,813
Claims priority, application United Kingdom, Apr. 28, 1981, 8113127
Int. Cl.³ B65B 67/12
U.S. Cl. 53—390 7 Claims

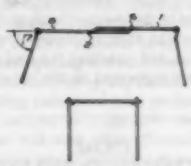
1. In a wire or rod device for maintaining the open end of a flexible bag in an open position so that the interior of the bag can be filled, said device comprising in combination

(a) a generally rectangular-shaped frame of variable area composed of a first U-shaped frame member having two side legs and a bottom end, and a second U-shaped member having two side legs and a bottom end, the side legs of said first and

second frame members having means for freely slidably engaging each other so that they are slidable toward and away from each other in closely parallel planes, with the open ends of said U-shaped frame members facing each other, and

(b) a U-shaped side member pivotably attached to the bottom end of each of said U-shaped frame members, each U-shaped side member having two side legs and a bottom end which are to be inserted in said bag,

the improvement which comprises said means for freely slidably engaging said legs set forth in (a) including locking



means for locking said legs together upon oppositely pivoting of said legs set forth in (b), and restricted pivotal attachment means for attaching each side member to a frame member so that each side member can be pivoted from a first folded position which is essentially above and parallel to said frame members through a limited arc to a second position beneath said frame members, said limited arc being within the range of 225°–270°, so that when said side members have been pivoted through said limited arc and are inserted in a bag, the bag presses against said pivoted side members to assist in locking said legs of said frame members to each other through said locking means.

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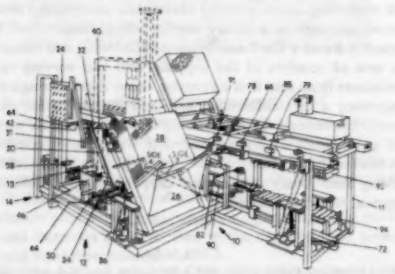
**4,479,345**

## CORRUGATED BOX FORMING, LOADING AND SEALING MACHINE

**Keith W. Nord, Stillwater, Minn., assignor to Ex-Cell-O Corporation, Troy, Mich.**

**Filed Jan. 28, 1982, Ser. No. 343,675**
**Int. Cl.³ B65B *43/30***
**U.S. Cl. 53—564** **9 Claims**



1. A machine for setting up corrugated box blanks having four side panels folded double and sealed along their otherwise adjacent free edges, with top and bottom flaps extending from each end of each side panel, said machine comprising framework, a magazine mounted on said framework for holding a plurality of said folded blanks, means mounted on said framework for removing individual blanks from the magazine and opening each into a vertically oriented four-sided tube, first transfer means mounted on said framework for moving each of said tubes laterally while closing the bottom trailing end flap thereof, means rotatably mounted on said framework for closing the bottom leading end flap to thus form an open-topped box while breaking the bottom side flaps and then rotating said open-topped box to a loading position, loading means mounted on said framework for depositing product into each open-topped box, a stationary rail and upper and lower pairs of converging guide rails mounted on said framework, second transfer means mounted on said framework for moving each of said loaded boxes off of said rotatably mounted means while closing the top trailing end flap and causing the top leading end flap to contact said stationary rail and bend into a closed position and causing the top and bottom side flaps to contact and travel along said upper and lower pairs of converging rails, means mounted on said framework for depositing an adhesive along each of the top and bottom oppositely disposed side flaps while said boxes are being moved, and means mounted on said framework for compressing said top and bottom side flaps onto the respective top and bottom leading and trailing end flaps to complete the sealing of said boxes, ready for discharge from said machine.

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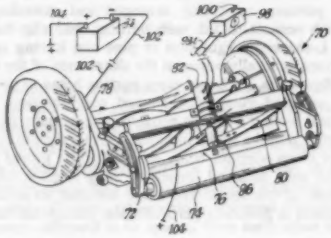
**4,479,346**

## AUTOMATIC ELECTRICAL BED KNIFE ADJUSTER

**Noel Chandler, 114 Venus St., Jupiter, Fla. 33458**

**Filed Mar. 31, 1981, Ser. No. 249,435**
**Int. Cl.³ A01D *55/22, 75/08***
**U.S. Cl. 56—250** **7 Claims**



1. An automatic electrical bedknife adjuster for a reel blade mower, said mower including a frame, a reel blade mounted on said frame, and a bedknife, comprising:

an electrical power source;

means connected to said bedknife for moving said bedknife relative to said reel blade;

means for generating an electrical signal representative of the contact pressure between said reel blade and said bedknife; and

means for controlling said means for moving said bedknife relative to said reel blade as a function of the contact pressure between said reel blade and said bedknife to establish optimum contact pressure for cutting.

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**4,479,347**

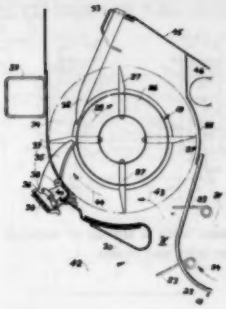
## LOADING VEHICLE FOR PICKING UP AND TRANSPORTING STRAW MATERIAL

**Borge Larsen; Poul K. Pedersen, and Georg Lauritzen, all of Kerteminde, Denmark, assignors to Maskinfabriken Taarup A/S, Kerteminde, Denmark**

**Filed Aug. 19, 1982, Ser. No. 409,413**
**Claims priority, application Denmark, Aug. 20, 1981, 3688/81**
**Int. Cl.³ A01D *87/10***
**U.S. Cl. 56—344** **9 Claims**

1. A loading vehicle for picking up and transporting straw material, comprising: a body for holding straw material; a rotary pick-up drum which is fitted at the front end of the body and has resilient pick-up fingers for passing the straw material up to a rotary conveyor drum including a conveyor drum inlet and a conveyor drum outlet and having conveyor arms fitted in rows for conveying the material up into the body of the vehicle through a duct, which at one side is defined by a housing at the outlet of the conveyor drum and at another side by

stationary strippers between which the conveyor arms pass and which strip the conveyed material from the conveyor arms, the pick-up drum rotating in the same direction of rotation as the conveyor drum and positioned obliquely below and behind the conveyor drum so that the conveying direction of



the straw material is abruptly changed at the inlet to the conveyor drum from a generally upward and rearward direction to a generally downward and forward direction to compact the straw material and equalize the distribution thereof across the conveyor drum inlet.

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**4,479,348**

## APPARATUS FOR SPINNING FASCIATED YARN

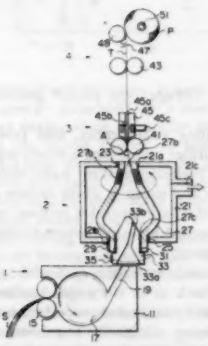
**Yoshiharu Yasui, Toyota; Kazuo Seiki, Kariya; Yoshihisa Suzuki, Chiryu, and Hisao Amano, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan**

**Filed Oct. 21, 1982, Ser. No. 435,888**

**Claims priority, application Japan, Oct. 27, 1981, 56-170765; Oct. 27, 1981, 56-170766**

**Int. Cl.³ D01H *5/28, 1/135***

**U.S. Cl. 57—404** **9 Claims**



**1.** An apparatus for spinning fasciated yarn, comprising a fiber-opening means for separating a supplied sliver into individual fibers, a fiber-collecting means for depositing said individual fibers on a fiber-collecting surface thereof, and an air nozzle for twisting said fibers in a shape of a continuous fiber bundle drawn off from said collecting surface by means of a vortex to form a resultant fasciated yarn, said spinning apparatus being characterized in that two pairs of first and second delivery rollers are arranged so that said air nozzle is disposed between said two pairs of first and second delivery rollers with said first delivery-rollers between the fiber-collecting means and the air nozzle, whereby said fiber bundle from said collecting surface can be processed within said air nozzle under an overfeeding condition.

**7.** An apparatus for spinning fasciated yarn comprising:

a fiber-opening means for separating a supplied sliver into individual fibers;

a fiber-collecting means for depositing said individual fibers on a fiber-collecting surface thereof,

said fiber-collecting means comprising a rotor in the shape of a hollow body and an inlet member provided with a fiber passage,

said rotor having a plurality of ventilation apertures in a wall thereof,

said inlet member being inserted coaxially into the interior of said rotor and being supported so as to be reversely rotatable in the direction of rotation of said rotor;

an air nozzle for twisting said fibers in a shape of a continuous fiber bundle drawn off from said fiber-collecting surface by means of a vortex to form a resultant fasciated yarn; and

first and second pairs of delivery rollers arranged so that said air nozzle is disposed between said pairs of delivery rollers, whereby said fiber bundle from said fiber collecting surface can be processed within said air nozzle under an overfeeding condition.

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**4,479,349**

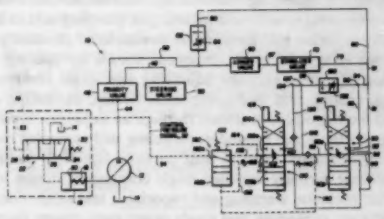
## HYDRAULIC CONTROL SYSTEM

**Robert C. Westveer, Kalamazoo, Mich., assignor to General Signal Corporation, Stamford, Conn.**

**Filed Nov. 19, 1981, Ser. No. 322,909**

**Int. Cl.³ F16D *33/02;* F16H *39/48***

**U.S. Cl. 60—420** **17 Claims**



**1.** A hydraulic control system, comprising:

a fluid reservoir;

a variable displacement pump having a fluid input in fluid communication with said fluid reservoir and a fluid output;

a first control valve having a fluid input in fluid communication with said fluid output of said variable displacement pump, said first control valve being adapted to regulate a flow of fluid to a first fluid actuated device and including first means for developing a first pressure signal;

at least a second control valve having a fluid input also in fluid communication with said fluid output of said variable displacement pump, said second control valve also being adapted to regulate a flow of fluid to a second fluid actuated device and including second means for developing a second pressure signal;

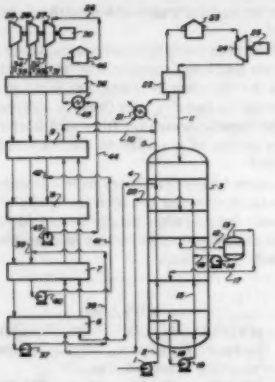
selector means for sensing individually said first and second pressure signals and for providing a control pressure signal which is the smaller of said first and second pressure signals and which is independent of the load placed on said first or second control valves by said first or second fluid actuated devices; and

fluid actuated displacement control means, which control means is in fluid communication with said selector means, for sensing said control pressure signal provided by said selector means and for regulating the displacement of said pump in response to the magnitude of said control pressure signal.

## 4,479,350
## RECOVERY OF POWER FROM VAPORIZATION OF LIQUEFIED NATURAL GAS

**Charles L. Newton, Bethlehem, and Dennis L. Fuini, Schnecksville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Mar. 6, 1981, Ser. No. 241,184**
**Int. Cl.³ F01K *23/02, 25/10***
**U.S. Cl. 60—655** **11 Claims**



1. A method for recovering net power from the vaporization of liquefied natural gas, which method comprises the steps of at least partially liquefying a multicomponent stream and a single component stream with said natural gas, pumping said at least partially liquefied multicomponent stream to an elevated pressure, warming said multicomponent stream by cooling and assisting in at least partially liquefying said single component stream, heating said multicomponent stream, expanding said heated multicomponent stream through an expander, recovering power from said expander, recycling said expanded multicomponent stream to be at least partially liquefied, pumping said at least partially liquefied single component stream to an elevated pressure, warming and vaporizing said single component stream, expanding said single component stream through an expander, recovering power from said expander, and recycling said expanded single component stream to be at least partially liquefied by said multicomponent stream.

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## 4,479,351
## VENTURI FLASH CIRCULATOR FOR GEOTHERMAL APPARATUS

**Leon Awerbuch, San Francisco, and Alfred N. Rogers, Pleasanton, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**

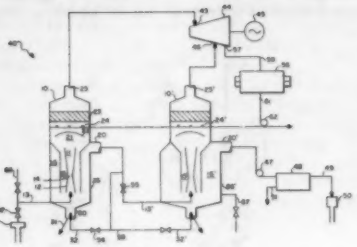
**Filed Jun. 22, 1983, Ser. No. 506,722**
**Int. Cl.³ F03G *7/00***
**U.S. Cl. 60—641.5** **13 Claims**

1. A system for processing fluid from a subterranean location with the fluid having an elevated temperature and pressure, having dissolved and suspended solids therein; and capable of being separated into solid, liquid and vapor fractions comprising:

a reactor for receiving a flow of the fluid from a subterranean location;

means in the reactor for permitting the fluid received thereby to flash to form the vapor fraction and to provide intimate contact of the solid, liquid and vapor fractions of the fluid in a three-phase fluidization relationship;

said permitting means including a tubular body having a fluid inlet, a fluid outlet above the inlet, and a middle



tubular section with a throat of smaller cross-sectional area than the inlet and outlet.

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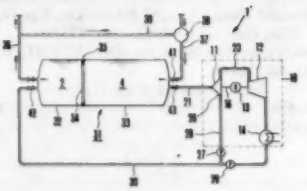
## 4,479,352
## HOT-WATER STORAGE TYPE POWER GENERATING UNIT

**Keijiro Yamaoka, and Hajime Endo, both of Tokyo, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan**

**Filed Jul. 21, 1982, Ser. No. 400,320**
**Claims priority, application Japan, Jul. 21, 1981, 56-114274**
**Int. Cl.³ F01K *3/00***
**U.S. Cl. 60—659** **13 Claims**



1. A hot water storage type power generating assembly comprising:

a power generating subassembly, said power generating subassembly further comprising a rotary separator turbine for separating high-temperature water into medium-temperature water and steam, a steam turbine driven by said steam from said rotary separator turbine, and a generator operatively coupled with said steam turbine for generating electric power;

a first tank selectively interconnected with said rotary separator turbine such as to store said medium-temperature water produced by said rotary separator turbine, said first tank further being selectively interconnected with said steam turbine such as to combine the steam output from said steam turbine with said medium-temperature water;

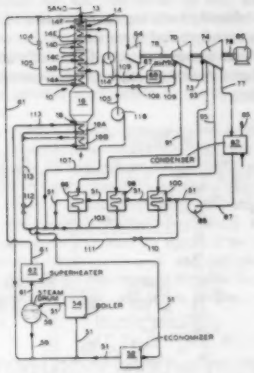
a hot water producing device interconnected with said first tank, said hot water producing device converting said medium-temperature water into high-temperature water; and

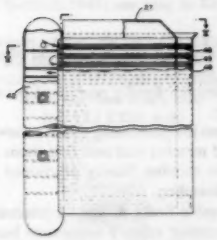
a second tank selectively interconnected with said hot water producing device, said second tank storing said high-temperature water supplied from said hot water producing device, said second tank further being selectively interconnected with said rotary separator turbine such as to selectively supply said rotary separator turbine with said high-temperature water.

## 4,479,353
## MOVING BED HEAT STORAGE AND RECOVERY SYSTEM

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 89,824, Oct. 31, 1979, Pat. No. 4,361,009. This application Sep. 17, 1982, Ser. No. 419,268
Int. Cl.³ F01K 3/00; F28D 19/02
U.S. Cl. 60—639 6 Claims



1. A heat storage and recovery system for storing excess over demand energy generated by a steam cycle electrical generating plant during slack electricity demand periods and for recovering the stored energy to provide supplemental electricity during peak electricity demand periods comprising:

moving bed heat exchanger means for exchanging heat between said system and the generating plant wherein said moving bed exchanger means comprises:

an inlet header having an inlet tube sheet;

an outlet header having an outlet tube sheet;

said inlet header having at least one inlet for admitting fluid to said heat exchanger;

said outlet header having at least one outlet for discharging fluid from said heat exchanger;

a plurality of tube banks each extending generally horizontally from said inlet tube sheet to said outlet tube sheet to establish fluid communication therethrough between said inlet header and said outlet header;

a shell encasing said plurality of tubes and being open at the top and the bottom;

said inlet header and said outlet header each having a plurality of diaphragms dividing said headers into a plurality of compartments;

said plurality of diaphragms including a number of section diaphragms being positioned in said headers between a corresponding number of same pairs of tube banks to divide the heat exchanger into a corresponding number of sections, and further including a number of subsection diaphragms being positioned in said headers between every other pair of tube banks and staggered as between headers such that each of said compartments is in fluid communication with the inlet and the outlet of its section;

said tube banks having a plurality of tubes being on a triangular pitched array and

a plurality of orifaced plates extending below each of said tube banks to support said tube banks and to retard the flow of sand therethrough over said tubes to provide an even sand flow velocity through the shell side of said heat exchanger and to provide a high sand bed density in contact with the entire periphery of each tube;

conduit means for establishing fluid communication between the steam cycle and said moving bed heat exchanger means wherein said conduit means comprises:

a plurality of turbine steam extraction pipes to separately divert intermediate and low pressure turbine steam to said heat exchanger means;

a plurality of feedwater heat pipes to separately direct the fluid diverted by said plurality of turbine steam extraction pipes, after having passed through said moving bed heat exchanger means, through feedwater heaters to be returned to the steam cycle at the main feedwater portion of the cycle;

a third pipe to establish fluid communication between the reheat portion of the steam cycle and said moving bed heat exchanger means for extracting reheated steam from the steam cycle;

a fourth pipe to establish fluid communication between said moving bed heat exchanger means and the steam cycle below the high pressure turbine and above the reheater to return the fluid extracted from the steam cycle via said third pipe; and,

a fourth pipe pump to pump the fluid through said pipe;

valve means for selectively opening and closing said conduit means to selectively admit fluid from different points in the steam cycle to said moving bed heat exchanger means;

a bed of refractory particles of suitable size for flowing through said moving bed heat exchanger means;

storage means for storing said bed of refractory particles; and,

transport means for transporting said refractory particles between said storage means and said moving bed heat exchanger means.

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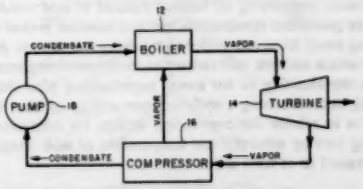
## 4,479,354
## LIMITED EXPANSION VAPOR CYCLE

Thomas Cosby, 1639 E. 84th Pl., Chicago, Ill. 60617

Continuation-in-part of Ser. No. 67,803, Aug. 20, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,434
Int. Cl.³ F01K 21/00
U.S. Cl. 60—670 2 Claims




1. A limited expansion vapor cycle apparatus comprising:

means for heating a fluid to produce a vapor;

means for deriving work from the vapor produced by said means for heating wherein the input pressure of said work deriving means is at a level such that the change in pressure of the vapor during operation of said work deriving means occurs at a greater rate than the change of the volume of the vapor, said work deriving means having at least one stage;

means for compressing vapor from the outlet end, wherein the compressor capacity is matched to the vapor output of the final stage of the work deriving means so that the pressure of the output is approximately one-half the final stage vapor inlet pressure, thereby restricting the expansion of the vapor output;

means for cooling the vapor during compression;

means for returning said compressed vapor to said means for heating; and

means for pumping a condensate produced during compression to said means for heating.

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**4,479,355**

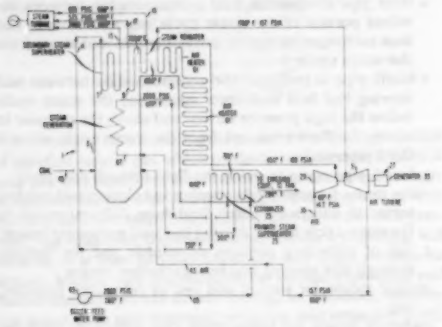
**POWER PLANT INTEGRATING COAL-FIRED STEAM BOILER WITH AIR TURBINE**

**John J. Guide, Wayne; Joseph E. Carey, Jr., Flanders; Paul D. Eichamer, Ironia; George Claypole, Sparta, and George V. Yenetchi, Randolph, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Feb. 25, 1983, Ser. No. 468,133**

**Int. Cl.³ F01K *23/02***

**U.S. Cl. 60—683** **26 Claims**



1. A power plant comprising the combination of: a steam turbine, a coal-fired steam boiler having a radiant section including a combustion zone and steam generating tubes and a convection section provided with tubes for heating compressed air by indirect heat exchange with flue gas; compressor means wherein air is compressed for passage to said convection section; air turbine means driven by expansion of air compressed by said compressor means then heated in said convection section and passed to the inlet of said turbine means; said turbine means being arranged to produce useful power; conduit means for passing air turbine exhaust to said combustion zone as preheated combustion air; and conduit means for removing steam from said boiler and passing the same to the inlet of the steam turbine; said radiant section containing means for steam superheating or for steam superheating plus steam reheating and absorbing a sufficient percentage of heat for said services to release the convection section for compressed air heating service whereby the temperature of said compressed air is raised to at least about 1450° F.

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**4,479,356**

**ELASTOMERIC ENERGY RECOVERY SYSTEM**

**John D. Gill, Annapolis, Md., assignor to Elastomer Energy Recovery, Inc., Annapolis, Md.**

**Filed Feb. 25, 1982, Ser. No. 352,081**

**Int. Cl.³ F01B *21/04***

**U.S. Cl. 60—699** **15 Claims**

1. An energy recovery system for use in a machine of the type in which a prime mover is arranged to drive a specified machine part via a rotatably driven shaft, said energy recovery system comprising:

elastomeric energy storage means in the form of a tube of elastomeric material having first and second ends;

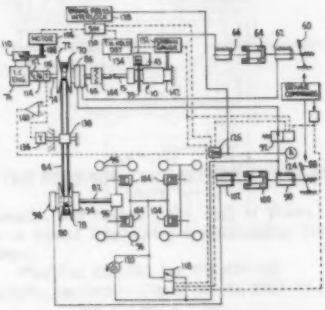
an elongated shaft having first and second ends;

means for supporting said elastomeric tube concentrically about and rotationally movable with respect to said elongated shaft;

a first end member fixedly secured to said shaft at said first end;

means for fixedly securing said first end of said elastomeric tube to said first end member;

a second end member disposed coaxially about said second end of said shaft for rotational movement with respect to said shaft;



means fixedly securing said second end of said elastomeric tube to said second end member;

a first frame member fixedly positioned proximate said first end member;

additional means for preventing relative movement between said first end member and said first frame member;

a second frame member fixedly positioned proximate said second end member;

selectively actuable brake means for alternatively preventing and permitting relative movement between said second end member and said said second frame member; and

further means coupling said driven shaft to said elongated shaft at said second shaft end.

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**4,479,357**

**METHOD AND APPARATUS FOR AUTOMATICALLY SYNCHRONIZING MULTIPLE ENGINES**

**Glenn D. Stewart, 210 Bayview Ave., Massapequa, N.Y. 11758**

**Division of Ser. No. 218,063, Dec. 19, 1980, Pat. No. 4,435,961. This application Jan. 9, 1984, Ser. No. 569,187**

**Int. Cl.³ F02B *73/00***

**U.S. Cl. 60—719** **15 Claims**

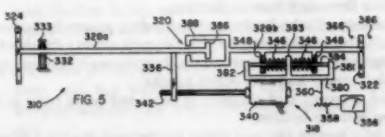

FIG. 5

1. In an apparatus for use in synchronizing the operation of at least a slave engine with that of a master engine,

manual and engine throttles movably connected with and for adjusting the operation of each of said engines,

servo means operable to adjust said slave engine throttle to synchronize it with the operation of said master engine

throttle when the master and slave engines operate asynchronously,

means comparing the operations of said master and slave engines and operatively connected with said servo means to operate said servo means to cause said slave engine to operate synchronously with said master engine,

means connecting said slave engine throttle with its respective manual throttle and providing a lost motion connection between said slave engine manual throttle and said slave engine throttle, said connecting means including operable means for the operation of said slave engine throttle directly in response to the operation of said respective manual throttle, and moving means connected with and between said servo means and said operable means to move to adjust said operable means and said slave engine throttle in response to the operation of said servo means,

and resilient yieldable means connected between said moving means and said servo means and applying a predetermined resistance to movement of said moving means in response to the operation of said slave engine manual throttle until the force applied by said slave engine manual throttle exceeds said predetermined force thereby enabling said slave engine and its throttle to be independently manually overcontrolled and adjusted by the movement of its respective manual throttle during operating adjustment thereof by said servo means.

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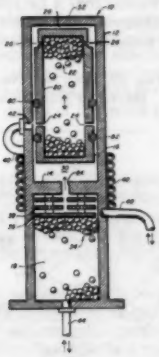
**4,479,358**

## MINIATURE CRYOGENIC COOLING SYSTEM WITH SPLIT-PHASE DUAL COMPRESSOR AND PHASE-SHIFTING DEVICE

**Calvin K. Lam, Bedford, N.H., assignor to Kryovacs Scientific Corp.**

**Continuation-in-part of Ser. No. 358,626, Mar. 16, 1982, Pat. No. 4,385,499. This application May 27, 1983, Ser. No. 498,866**
**The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.**
**Int. Cl.³ F25B 9/00**
**U.S. Cl. 62—6** **15 Claims**



1. In a miniature cryogenic system having two compressors with two outlets, first and second conduits carrying a working fluid, each conduit connected to one of the outlets, said working fluid pressurized in a split-phase relationship by said compressors, wherein the improvement comprises a cold finger assembly including:

an elongate housing having a cryogenically cooled end and an internal abutment dividing said housing into first and second interior compartments, said first compartment extending from said cooled end to said abutment;

a displacer disposed slidingly within said first compartment for longitudinal reciprocating motion therein and creating a first working volume between said cooled end and said displacer and creating a second working volume between said displacer and said abutment;

a first regenerative bed disposed within said displacer;

a first inlet means located in said housing adapted for providing fluid communication between said first conduit and said first interior compartment;

first and second port means in said displacer providing fluid communication through said first regenerative bed between said first inlet means and said first working volume;

a second regenerative bed disposed within said second interior compartment;

a second inlet means in said housing providing fluid communication through said second regenerative bed between said second conduit means and said second working volume; and

means to develop transient cushioning overpressures in said first and second working volumes as said displacer reciprocates alternately toward said cooled end and toward said abutment under the push-pull influence of said split-phase working fluid flow from said compressors whereby cooling is effected in said first and in said second working volumes; and

wherein said compressors comprise a single housing including first and second cylindrical cavities disposed therein, the axes of said first and second cavities oriented at a right angle to one another, first and second pistons disposed for reciprocating motion within said first and second cavities respectively; and motor means for reciprocating said pistons to generate said split phase working fluid flow.

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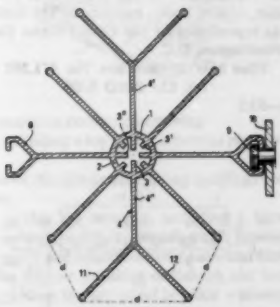
**4,479,359**

## ATMOSPHERIC HEATERS

**Pierre Pelloux-Gervais, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France**

**Continuation of Ser. No. 304,635, Sep. 22, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,793**
**Claims priority, application France, Oct. 1, 1980, 80 21003**
**Int. Cl.³ F17C 7/02**
**U.S. Cl. 62—52** **15 Claims**



1. A heat exchanger for vaporizing a cryogenic liquid, comprising a tube having external and internal heat transfer fins, at least two said internal fins extending radially toward the tube axis for a distance of at least 0.6R, the other internal fins extending radially toward the tube axis between 0.2R and 0.5R, where R is the internal tube radius, each of at least two said external fins being outwardly extended by two fin-branching webs, each said web being parallel to the immediately adjacent external fin, the distances between outer edges of each pair of adjacent said fin and fin web being substantially equal.

4,479,360

## CRYOPUMP

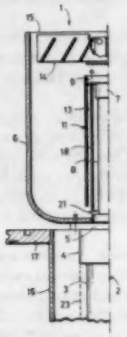
Werner Bächler, Rosrath - Hoffnungsthal, and Rolf Heisig, Weilerswist, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,353

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232324

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 8 Claims



1. In a cryopump having two refrigerator stages operable for producing progressively lower temperatures and at least one surface between the refrigerator stages and in such thermal communication therewith as to have, during operation of the refrigerator stages, temperatures which adsorb and desorb thereon at least one gas in the cryopump, the improvement comprising:

shield means extending over substantially all of the surface for substantially preventing the gas from circulating to the surface; and

means for maintaining the shield means at a substantially constant temperature during operation of the refrigerator stages.

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4,479,361

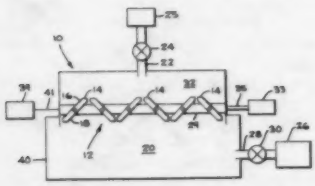
## GAS PUMP WITH MOVABLE GAS PUMPING PANELS

John E. Osher, Alamo, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1983, Ser. No. 471,391

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 20 Claims



1. A gas pump apparatus for pumping gas from a space; comprising:

an array of movable gas capture pumping members;

each of said pumping members defining a plurality of surfaces facing in different directions, each of said surfaces being constituted by material for capturing gas;

means for mounting said array of movable pumping members in a gas flow communication with said space in a number of different end-to-end positions to define a volume zone isolated from said space, at least one surface of each of said pumping members facing said space, a different surface of each of said pumping members facing said volume zone for different positions of said pumping members;

means for reactivating surfaces of said pumping members facing said volume zone; and

means for moving said means for mounting to locate said pumping members in a selected one of said different positions.

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4,479,362

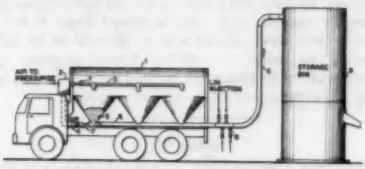
## CRYOGENIC COOLING OF PNEUMATICALLY TRANSPORTED SOLIDS

Thomas E. McWhorter, Chesire, United Kingdom, and Barry J. Halper, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 10, 1982, Ser. No. 448,560

Int. Cl.³ F25D *13/06*

U.S. Cl. 62—63 3 Claims



1. A process for cooling cement being conveyed in a pneumatic transport line which comprises injecting a cryogenic fluid into said transport line at a point such that the distance of the line from a source of the cement to the point of injection is between 1% to 10% of the distance of the line from the injection site to a delivery point, and whereby said cement is cooled to a temperature between 80° to 100° F.

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4,479,363

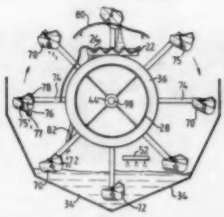
## FREEZING A LIQUID

Peter H. Gibson, Inkberrow, and Robert I. Taylor, Guildford, both of England, assignors to The BOC Group plc, London, England

Filed Feb. 10, 1983, Ser. No. 465,417

Int. Cl.³ F25D *13/06*

U.S. Cl. 62—63 20 Claims



1. A process for freezing a liquid to form generally spherical, discrete frozen bodies of the liquid comprising the steps of:

discharging a pulsating and substantially continuous flow of the liquid through at least one orifice;

flowing a stream of liquefied gas having a boiling point below −30° C. along a channel;

contacting said discharged liquid flow with said stream of liquefied gas in said channel for a time period sufficient to freeze at least the peripheries of said bodies which then flow with said stream of liquefied gas along said channel;

controlling the rate at which said liquid is discharged from

said orifice such that a substantial portion of said discrete frozen bodies exhibit a cross-sectional area greater than the diameter of said orifice; and

collecting said discrete, frozen bodies.

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**4,479,364**

## SORPTION UNITS AND METHODS FOR THEIR OPERATION

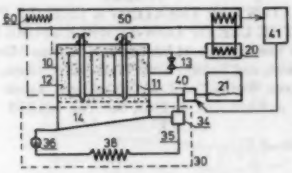
**Peter Maier-Laxhuber, Saumweberstr. 14, 8000 München 60, Fed. Rep. of Germany**

**Filed Feb. 15, 1983, Ser. No. 466,575**

**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205285; Mar. 3, 1982, 3207656**

**Int. Cl.³ F25B *15/00***

**U.S. Cl. 62—141** **20 Claims**




1. A sorption unit adapted to be simultaneously used as a heat pump and a heat reservoir comprising;

at least one boiler adsorber **10** containing a sorption medium **12** for boiling out and sorbing a work medium,

a heat exchanger **11** in the boiler adsorber **10** in communication with the sorption medium **12** for transmittal of stored specific heat from the sorption medium to the exterior of the boiler adsorber **10**,

a condenser **20** connected to the boiler adsorber **10** to receive work medium expelled from the sorption medium and to be condensed therein,

a storage tank **21** connected to the condenser to receive condensed work medium,

a controlling element for controlling the discharge of heat from the boiler adsorber **10** to a consumer **50**, and

the controlling element being a heat discharge controller **41** interconnected with the boiler adsorber **10** and the consumer **50** so as to be capable of monitoring pressure conditions in the boiler adsorber **10** and the intervals, temperature, and power output of the useful heat discharged.

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**4,479,365**

## WATER COOLED AIR CONDITIONING AND HEATING ACCESSORY TRANSFER COIL KIT

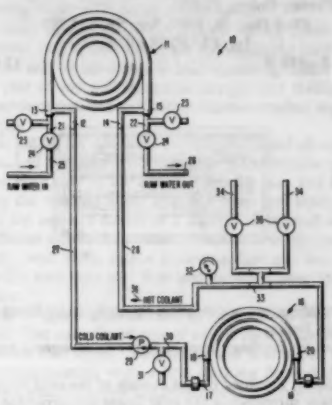
**Alan G. Holmes, 8302 Purcell Dr., Orlando, Fla. 32817**

**Filed Aug. 8, 1983, Ser. No. 521,427**

**Int. Cl.³ F25B *27/02***

**U.S. Cl. 62—238.6** **1 Claim**

1. A water cooled air conditioning and heating accessory coil kit, comprising, in combination, an exterior coil, a plurality of valves secured to said exterior coil, and a pair of coolant lines secured to said exterior coil; said exterior coil being of circular wound tubing, and being coupled to the water supply of a building in which the air conditioner or heating unit is located, and is also coupled to the normally water cooled and existing coil of said air conditioner or heating unit; said pair of coolant lines of said exterior coil comprising a cold coolant line suitably coupled to the output side of said exterior coil, and being coupled to the input side of a coolant pump, and the output side of said pump is coupled to a priming valve, which is fixedly secured in a third line suitably coupled, at one end, to the input side of said existing coil, for charging the coolant system of said exterior coil and said existing coil, with a suitable manufactured coolant liquid, and said third line is coupled, at its output end, to the input side of said existing coil, and the output side of said existing coil is coupled to the input side of a hot coolant line, which is the second of said pair, and the input side of said hot coolant line is also suitably coupled to a




pair of expansion pipes, a coolant temperature gauge, and to the output side of said exterior coil.

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**4,479,366**

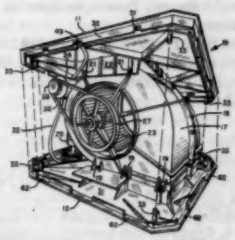
## EVAPORATIVE COOLER

**Ted B. Lanier, Mesa, Ariz., and Ras Redwine, V, Amarillo, Tex., assignors to RLI, Inc., Tempe, Ariz.**

**Filed Apr. 26, 1982, Ser. No. 371,786**

**Int. Cl.³ F28D *5/00***

**U.S. Cl. 62—304** **5 Claims**



1. An evaporative cooler, comprising:

a housing including a top panel, a bottom panel and four side panels;

at least one of the side panels having openings and providing air inlets;

a blower within the housing, including a blower shroud having means for rigidly securing the blower shroud to the top panel and to the bottom panel, said blower shroud fixing the relative positions of the top and bottom panels and supporting the top panel in place with respect to the bottom panel;

means for connecting the four side panels to the top panel and to the bottom panel, such that the side panels can be removed while the top and bottom panels remain secured in position;

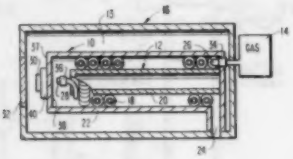
water-retaining means attached in the housing adjacent the side panels providing said air inlets, and including water supply and delivery means for wetting the water-retaining means for evaporation of water into the air as it is drawn into the housing through said air inlets; and

a cooled air outlet in the housing, connected to the blower outlet, for delivery of the cooled air to a space.

## 4,479,367
## THERMAL FILTER

J. Stanley Buller, Tampa, Fla., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 28, 1981, Ser. No. 334,783
Int. Cl.³ F25B 19/00
U.S. Cl. 62—514 R 15 Claims




12. In combination, a detection assembly comprising
(a) a cold finger;
(b) means for cooling the cold finger to cryogenic temperatures;
(c) a detector mounted on the outside of the cold finger; and
(d) a dewar surrounding the cold finger and provided with a window operably associated with the detector and transparent to radiation capable of being detected by the detector,
characterized in that a thermal filter is interposed between the detector and the cooling means, the thermal filter comprising at least two layers of a first material having a high heat conductivity and high heat capacity separated by a layer of a second material having a high thermal resistance.

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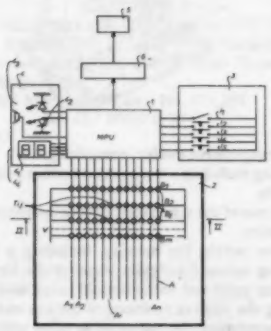
## 4,479,368
## PROGRAMMABLE KNITTING MACHINE

Alfred Gloeckler, Mulhouse, France, assignor to Superba S.A., Mulhouse, France

Filed Sep. 17, 1982, Ser. No. 419,212
Claims priority, application France, Sep. 28, 1981, 81 18239
Int. Cl.³ D04B 7/00, 15/66
U.S. Cl. 66—75.2 6 Claims



1. In a programmable knitting machine including at least one grooved holder for receiving transversely-slideable needles activated by a carriage which is displaceable in the longitudinal direction on the holder, the carriage comprising means for selecting and directing needles along various pathways either for jacquared weaving or fancy stitching, the improvement comprising a microprocessor having a memory connected to a pattern and knitting coding matrix by an electrical connection including several conductors forming a first group of conductors, the number of conductors comprising the first group being equal to the number of columns or lines of said matrix, said electrical connection further including a second group of conductors forming the lines or columns of said matrix crossing each one of the conductors of the first group without being in contact therewith when the matrix is inoperative, a common electrical supply line interconnected with each of the conductors of the second group of conductors, needle selection means responsive to an output signal from said microprocessor, selector means for controlling input functions to said microprocessor including line-by-line programming by a signal from said matrix at each point where contact is established between a conductor of the first group and a conductor of the second group, and display means for indicating the programmed memory of said microprocessor by said pattern and knitting coding matrix.

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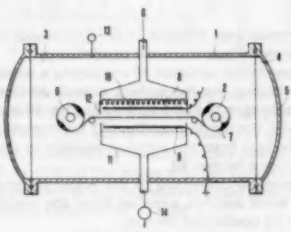
## 4,479,369
## APPARATUS FOR TREATING A TEXTILE PRODUCT WITH THE USE OF LOW-TEMPERATURE PLASMA

Yoshikazu Sando; Hiroshi Ishidoshiro; Matsuo Minakata, all of Wakayama, and Tokuju Goto, Nara, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Apr. 4, 1983, Ser. No. 481,851
Int. Cl.³ D06B 3/10
U.S. Cl. 68—5 C 7 Claims



1. An apparatus for treating a textile product with a low temperature plasma comprising a reactor, a first electrode plate and a second electrode plate arranged within the reactor opposite one another in facing relation and forming therebetween a passage, each of said first electrode plate and second electrode plate having a first surface and an oppositely facing second surface with said first surfaces facing one another and defining the opposite sides of the passage, each of said first electrode plates and second electrode plate having a first side along one edge of said first and second surfaces and an opposite second side along an opposite edge of said first and second surfaces with said first sides and second sides disposed opposite one another and defining the opposite ends of said passage, means for transporting a textile product through said passage in the direction extending between the first and second sides, said transporting means including a first take-up shaft located adjacent to and spaced outwardly from said first sides and a second take-up shaft located adjacent to and spaced outwardly from said second sides so that a textile product wound on one of said first or second take-up shafts can be unwound from the one of said first and second take-up shafts and wound on the other of said first or second take-up shafts with the textile product passing through said passage, a mechanism connected to said reactor for maintaining a vacuum within said reactor, said first and second electrode plates being formed of a gas porous material, means for supplying gas to said second surface of said first electrode plate so that the gas flows through said first electrode plate across said passage and through said second electrode plate, means for collecting the gas flowing through said second electrode plate for conveying the gas out of said reactor, and means connected to said first electrode plate and said second electrode plate for producing a low-temperature

plasma in the space between the first surfaces of said first and second electrode plates.

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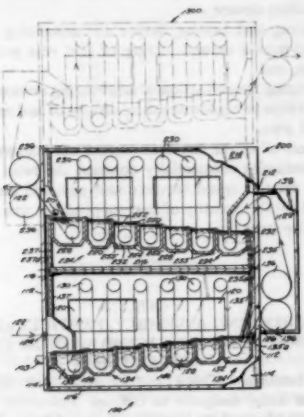
**4,479,370**

## FULL COUNTERFLOW MINI-BATH OPEN-WIDTH FABRIC WASHER

**Kenneth Y. Wang, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.**

**Filed Dec. 10, 1981, Ser. No. 329,594**
**Int. Cl.³ D06B** *3/12, 15/02*
**U.S. Cl. 68—22 R** **16 Claims**



1. Apparatus for treating a continuously moving textile material with a liquid comprising at least two units stacked in a vertical arrangement so that said textile material will pass through each unit in ascending order and the effluent treating liquid of a superiorly stacked unit will gravitationally flow into the influent side of an immediately lower stacked unit, the most superior unit characterized as including inlet means for introducing liquid at a predetermined rate of flow into the influent side of said superior unit and the most inferior unit characterized as including outlet means for transferring liquid at a predetermined rate of flow from the effluent side of said inferior unit to a predetermined location, each of said units comprising:

an enclosure including a pair of opposing end walls, a pair of opposing side walls, a bottom wall and a top wall, wherein a first one of said pair of opposing end walls includes means defining at least one inlet for allowing input of said textile material therethrough and the other of said pair of opposing end walls includes means defining at least one exit for allowing output of said textile material therethrough;

a plurality of upper and lower rolls rotatably mounted within said enclosure in a staggered arrangement so that they are vertically and horizontally spaced from one another;

a plurality of separate tank means located in said enclosure for containing a volume of liquid therein, said tank means being positioned in an ascending arrangement between influent and effluent tank means so that the liquid cascades from each of said tank means to the next tank means in descending order to effect counter flow of the liquid relative to the general path of conveyance of said textile material through said enclosure, each tank means including contouring means for contouring the shape of said tank means to the general shape of said lower rolls and for effecting constant agitation of said liquid contained therein by virtue of said textile material being conveyed therethrough to provide a relatively constant concentration gradient for said liquid;

conveying means for conveying said textile material through said unit;

mounting means for mounting said unit in opposite vertical arrangement with other similar units;

squeezing means exteriorly located on the textile material output end of said enclosure for squeezing residual liquid from said textile material, said squeezing means including a pair of nip roll means to accept said textile material therebetween and to forcibly remove residual liquid therefrom; and

baffle means for directing the effluent liquid of a superiorly stacked unit to the influent side of the interior portion of the enclosure of the adjacent inferior unit and for directing the residual liquid removed from said textile material by the nip roll means of a superiorly stacked unit to the effluent side of the interior portion of the adjacent inferior unit, said baffle means including first and second upper baffle members and first and second lower baffle members,

said first upper baffle member (i) rigidly fixed with respect to said first one of said pair of end walls and defining therewith a first upper channel, (ii) said first upper channel in communication with a first opening formed in said top wall, and (iii) extending from said first top wall opening to said influent tank means,

said second upper baffle member, (i) rigidly fixed with respect to said other of said pair of end walls and defining therewith a second upper channel, (ii) said second upper channel in communication with a second opening formed in said top wall, and (iii) extending from said second top wall opening to said effluent tank means,

said first lower baffle member, (i) rigidly fixed between said influent tank means and said first one of said pair of end walls and defining with said first one end wall a first lower channel, (ii) said first lower channel in communication with a third opening formed in said bottom wall and registered with said second opening of said top wall of the adjacent inferior unit, and (iii) extending from a point below said textile material outlet to said third opening,

said second lower baffle member, (i) rigidly fixed between said effluent tank means and said other of said pair of end walls and defining with said other end wall a second lower channel, (ii) said second lower channel in communication with a fourth opening formed in said bottom wall and registered with said first opening of said top wall of the adjacent inferior unit, and (iii) extending from a point below said textile material inlet to said fourth opening,

whereby liquid gravitationally flows from said effluent tank means of a superiorly stacked unit to the influent tank means of an adjacent inferiorly stacked unit by virtue of the communication established therebetween by said second lower channel of said superiorly stacked unit and said first upper channel of said adjacent inferiorly stacked unit while said residual liquid removed from said nip roll means associated with said superiorly stacked unit gravitationally flows to said effluent tank means of said adjacent inferiorly stacked unit by virtue of the communication established therebetween by said first lower channel of said superiorly stacked unit and said second upper channel of said adjacent inferiorly stacked unit.

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**4,479,371**

## WASHING AND EXTRACTING MACHINE

**Robert H. Fesmire, Barrington Hills, and Warren T. Hansen, Glenview, both of Ill., assignors to Ellis Corporation, Chicago, Ill.**

**Filed Dec. 13, 1982, Ser. No. 449,142**
**Int. Cl.³ D06F** *23/02, 37/22, 37/26*
**U.S. Cl. 68—23.1** **9 Claims**

1. A washing and extracting machine capable of being pivoted to load and unload laundry material, comprising:

a frame,

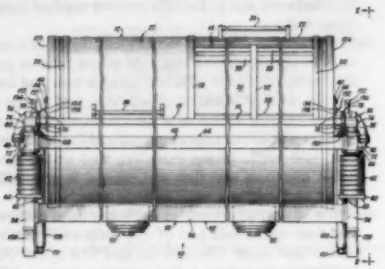
a cylinder rotatably mounted on said frame,

means for rotating said cylinder relative to said frame at a

plurality of speeds including a variable first speed for washing said laundry material and a variable second speed for extracting liquid from said laundry material,

means for allowing said cylinder to pivot on said frame to load and unload said laundry material,

means for pivoting said cylinder relative to said frame, said pivoting means including an extensible member secured to said frame at a first end and to said cylinder at a second



end, said second end slidably mounted in a slot fabricated in a bracket secured to said cylinder to allow limited movement of said second end relative to said cylinder, and

means for locking said second end in said slot, said locking means including a latching lever movable from a first position out of engagement with said second end to a second position engaging and locking said second end in said slot, and means for actuating said latching lever from said first and second positions.

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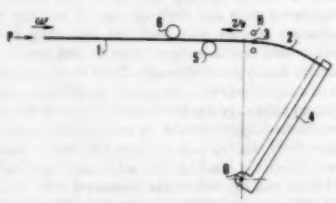
**4,479,372**

## METHOD OF MANUFACTURING METALLIC BENT PIPE

**Yasuo Watanabe, Kawasaki, Japan, assignor to Dai-Ichi High Frequency Co., Ltd., Kanagawa, Japan**

**Filed Aug. 12, 1983, Ser. No. 522,586**
**Claims priority, application Japan, Sep. 3, 1982, 57-152655**
**Int. Cl.³ B21D *7/16***
**U.S. Cl. 72—128** **12 Claims**



1. A method of manufacturing a metallic bent pipe having straight pipe portions at both ends of a bent pipe center portion and having the entire pipe subjected to heat treatment by employing an apparatus which effects bending processing such that a metallic pipe to be bent is locally heated by an annular heating device provided with a cooling device and cooled immediately after the heating, and a bending moment is applied to said center portion of the pipe while said heating device is being relatively moved in the longitudinal direction of said pipe thereby to simultaneously bend and heat-treat said pipe, comprising the steps of:

inserting the front end portion of said pipe into said heating device mounted for travel a predetermined distance forward and rearward in the longitudinal direction of said pipe, and advancing said pipe with the travel of said heating device suspended, thereby to heat-treat a first section of said front end portion of said pipe;

retracting said heating device and advancing said pipe to heat-treat a second section of said front end portion of said pipe;

suspending the advance of said pipe while retracting said heating device thereby to heat-treat a third section of said front portion of said pipe while clamping the leading end of said center portion of said pipe by a bending device;

suspending the retraction of said heating device and advancing said pipe while applying a bending moment to said center portion thereby to bend the same;

suspending the advance of said pipe while retracting said heating device to thereby heat-treat a first section of the rear portion of said pipe, and releasing said pipe from said bending device;

retracting said heating device and advancing said pipe to heat-treat a second section of said rear portion of said pipe; and

suspending the retraction of said heating device and moving said pipe to heat-treat a third section of said rear portion of said pipe,

wherein all of the steps are carried out continuously while maintaining substantially constant the ratio between (a) the relative speed between said pipe and heating device and (b) the quantity of heat supplied per unit time in each of the steps.

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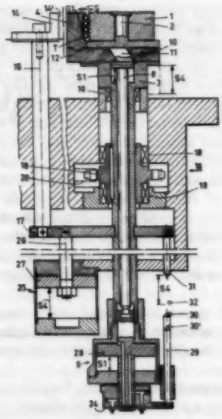
**4,479,373**

## TUBE BENDING ASSEMBLY, PARTICULARLY FOR THIN WALL AND SMALL AND MEDIUM DIAMETER METAL TUBES

**Renzo Montorfano, Cantù , and Virginio Montorfano, Capiago, both of Italy, assignors to Officina Meccanica Montorfano S.n.c. di Montorfano Virginio e Renzo, Cantù , Italy**

**Filed Jun. 29, 1982, Ser. No. 393,627**
**Claims priority, application Italy, Jul. 10, 1981, 22872 A/81**
**Int. Cl.³ B21D *7/04***
**U.S. Cl. 72—158** **15 Claims**



1. A tube bending assembly, particularly for metal tubes of small and medium diameter and thin wall, comprising a rotatable die with a substantially smooth cylindrical skirt; a sliding block angularly rotatable relative to the axis of rotation of said die, this sliding block being provided with a groove so shaped as to receive or accomodate one or more tubes to be bent; said sliding block groove and a tube bearing plane being arranged parallel to the longitudinal axis of the tube to be bent; said die and sliding block and shoulder being retractable in a direction perpendicular to the bending plane and upon bending.

4,479,374

## STRIP-ROLLING METHOD AND APPARATUS

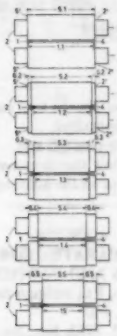
Hugo Feldmann, Alsdorf; Karl Illert, Neuss; Willi Benz, Neuss, and Heinrich Bohnenkamp, Neuss, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1983, Ser. No. 469,137

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206556; Jun. 21, 1982, 3223099

Int. Cl.³ B21B *28/04*

U.S. Cl. 72—236 9 Claims



1. In a rolling method wherein in each of a succession of passes forming a single run a strip travels through a nip defined between a pair of parallel and nearly cylindrical working rolls braced against respective backing rolls so that with each pass the thickness and width of the strip are reduced, the ends of the working rolls projecting laterally beyond the longitudinal edges of the strip, the improvement comprising the step of:

reducing the diameters of the projecting ends of the working rolls several times after respective passes in a single run so that the working rolls only contact the respective backing rolls along a distance equal generally to the workpiece width.

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4,479,375

## BENDING MANDREL ARRANGEMENT

Siegfried Klaus, Ennepetal, and Albert Einhaus, Hagen, both of Fed. Rep. of Germany, assignors to Rolf Peddinghaus, Ennepetal, Fed. Rep. of Germany

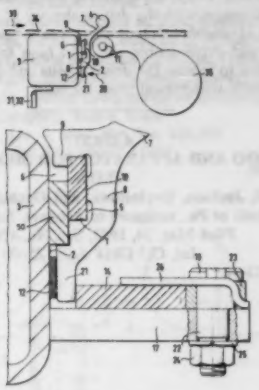
Continuation of Ser. No. 248,315, Mar. 27, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,856

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013849

Int. Cl.³ B21D *7/022*

U.S. Cl. 72—387 8 Claims

1. A bending mandrel arrangement for simultaneous bending of a plurality of steel wires, comprising a work support having a surface on which said wires are supported, a plurality of bending mandrels, around which said wires may be bent, mounted on said work support, a bending bar mounted adjacent said work support for guided movement around said mandrels, a track rail extending along a surface of said work support other than said surface on which the work is supported adjacent said bending bar, said track rail having a wall which is engageable by said mandrels and which is substantially perpendicular to said surface on which the work is supported, said track rail being spaced from said work support to define a grooveway which opens towards said work support surface between said track rail and said work support, each said bending mandrel comprising a crank arm having a first end engageable in said grooveway, a second end having a clearance with respect to a fixed part of the arrangement in a direction normal to said wall, and being provided intermediate said ends with a seating face which engages said wall, and clamping means movable normally with respect to said wall to urge said second ends of said crank arms towards said work support to reduce



said clearance and to effect clamping engagement between said arms and said track rail.

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4,479,376

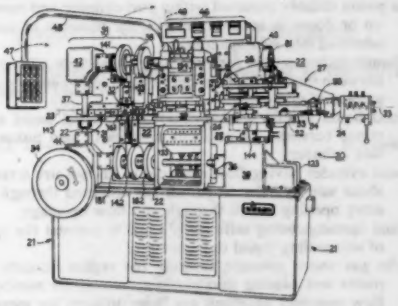
## VERTICAL FOURSLIDE METAL FORMING MACHINE

Robert E. Carlson, South Venice, Fla., and Halsey W. Skilton, Torrington, Conn., assignors to The A. H. Nilson Machine Co., Inc., Shelton, Conn.

Filed Mar. 1, 1982, Ser. No. 353,189

Int. Cl.³ B21D *37/12*

U.S. Cl. 72—455 5 Claims



1. A fourslide metal wire and strip forming machine having stock feeding, clamping, stamping, bending and cut-off units incorporation clamping jaws and tooling acutated by rotating camshafts, comprising

a frame on which the rotating camshafts are journalled and geared together for synchronized rotation,

a base underlying and supporting the frame,

a clutchshaft rotatably journalled in the base, in separate bearings respectively positioned near each of its ends, having one end drivingly engaged by gearing to the camshafts, and having coaxially mounted thereon a multi-belt V-belt driven sheave rotatably mounted for free rotation; an electric clutch engageable for torque-transmitting connection of the driven sheave and the clutchshaft; an electric brake; a removable end journal bearing block secured to the base and rotatably supporting the end of the clutchshaft opposite to the camshafts and providing access when removed for adjustment, disengagement, removal and replacement of the electric clutch and the electric brake;

and electric drive motor mounted on the base having a motor shaft substantially parallel to the clutchshaft, with a mult-belt V-belt drive sheave positioned for belt-driving engagement with the driven sheave;

and an adjustable belt tensioning means operatively connecting said drive motor and said base for relaxing V-belt tension to release the driving belts and free the motor for movable withdrawal from the base.

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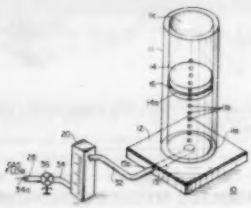
**4,479,377**

## METHOD AND APPARATUS FOR MEASURING GAS FLOW

**George R. Jackson, Doylestown, and Donald C. Frick, Levittown, both of Pa., assignors to Arcstart, Inc., Oakford, Pa.**

**Filed Mar. 24, 1983, Ser. No. 478,319**
**Int. Cl.³ G01F *1/22, 25/00***
**U.S. Cl. 73—3** **23 Claims**



1. A device for flow calibration comprising:

a hollow cylinder closed at its base and having an open upper end;

said cylinder having an entry opening for admitting gas under pressure;

a piston slidably mounted within said cylinder and movable up or down in accordance with the pressure of the gas admitted into said cylinder;

liquid sealing means for providing a gas-tight sliding seal between the annular periphery of said piston and the inner surface of said cylinder;

said liquid sealing means including a sealing liquid maintained between the adjacent surfaces of said piston and said cylinder;

said cylinder having flow openings of known size arranged about said cylinder to permit gas admitted through said entry opening to exit through said flow openings;

said openings being sufficiently small to prevent the egress of said sealing liquid therethrough;

the gas under pressure entering the region beneath said piston and causing said piston to move, the number of flow openings expelling gas being utilized for measurement purposes.

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**4,479,378**

## METHOD AND SYSTEM FOR DETERMINING EFFECT OF UNDERWATER EXPLOSION ON SUBMERGED STRUCTURES

**Alexander Malakhoff, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 23, 1982, Ser. No. 422,409**
**Int. Cl.³ G01N *33/22;* G01M *10/00***
**U.S. Cl. 73—12** **3 Claims**

1. A method for experimentally determining response characteristics and strength capacity of submerged hull structures in shallow water comprising the steps of:

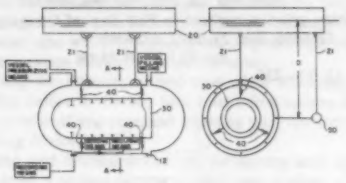
submerging the hull structure within a pressure vessel container,

floating the pressure vessel container to a predetermined depth for experiencing a full blast effect,

spacing the hull structure within the pressure vessel container sufficient to accommodate structural deformations and rigid body motions,

filling the pressure vessel container with water,

pressurizing the pressure vessel to a pressure corresponding to a predetermined depth,



positioning an explosive charge to a stand-off distance from the pressure vessel container,

exploding the explosive charge, and

measuring and recording the response characteristics and strength capacity data of the submerged hull structure.

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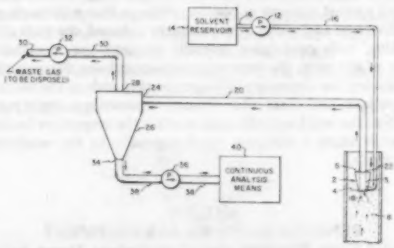
**4,479,379**

## METHOD AND APPARATUS FOR CONTINUOUS ANALYSIS OF A GAS AND PARTICULATE STREAM

**Gary P. Tarcy, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Filed May 25, 1983, Ser. No. 497,902**
**Int. Cl.³ G01N *31/00, 1/22;* B01D *53/00***
**U.S. Cl. 73—23** **17 Claims**




7. An apparatus for continuous analysis of a gas and particulate stream, said apparatus comprising:

(a) a sampling nozzle having an inlet portion and an outlet portion, said nozzle having an aerodynamic shape to provide isokinetic sampling of said stream;

(b) injector means for injecting a gas-dissolving solvent into a portion of said gas and particulate stream in said nozzle inlet portion to form an aerosol;

(c) an elongated sampling line having a first end and a second end spaced from said first end, said first end of said sampling line communicating with the outlet portion of said nozzle for flowing therethrough said portion of said gas and particulate stream and aerosol thereby impinging the aerosol against the inner surface of said sampling line to wet said inner surface with solvent and thereby scrubbing said portion of said stream flowing therethrough to enhance dissolution of gas in the solvent;

(d) separator means for separating solvent and particulate from undissolved waste gases in said portion of said stream, said separator means being in communication with the second end of said sampling line;

(e) transport means for transporting the separated solvent and particulate from the separator means to a continuous analysis means; and

(f) continuous analysis means for determining the concentration of dissolved gas and particulate, said continuous

analysis means being in communication with said transport means.

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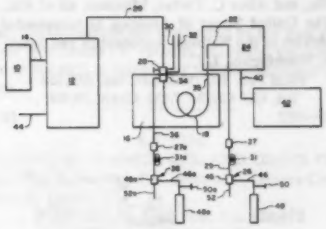
4,479,380

## OPEN-TUBULAR SUPERCRITICAL FLUID CHROMATOGRAPHY

Milos Novotny, Bloomington, Ind.; Milton L. Lee, Spanish Fork, Utah; Paul A. Peaden; John C. Fjeldsted, both of Provo, Utah, and Stephen R. Springston, Bloomington, Ind., assignors to Brigham Young University, Provo, Utah

Filed Feb. 26, 1982, Ser. No. 352,890
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—61.1 C 24 Claims



1. Apparatus for chromatographic analysis which comprises an elongated passageway having inlet and outlet ends and being entirely open between said ends, means for introducing fluid into the inlet end of said passageway, means for removing fluid from said outlet end, means for subjecting fluid in said elongated passageway to temperature and pressure near the critical temperature and pressure of said fluid, means for introducing into said fluid upstream from said inlet end a sample of material to be analyzed chromatographically, and means for subjecting fluid to which said sample has been introduced near or after removal from said outlet end to detection.

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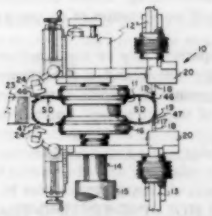
4,479,381

## TIRE DYNAMIC IMBALANCE SCREENING SYSTEM

Kenneth L. Kounkel, Silver Lake, Kans.; Loren K. Miller, Tallmadge; Kenneth A. Spriggel, Akron, and Stephen L. Williams, Doylestown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 188,707, Sep. 9, 1980, Pat. No. 4,414,843. This application Oct. 24, 1983, Ser. No. 544,837
Int. Cl.³ G01M *1/00, 17/02*
U.S. Cl. 73—66 19 Claims



1. Apparatus for predicting the ride property of a tire comprising:

sensing means for sensing the lateral asymmetry of the tire; and

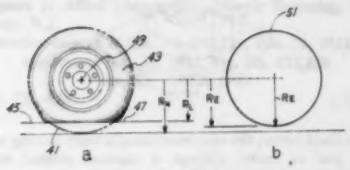
comparing means for comparing the lateral asymmetry to a predetermined value whereby the ride property of the tire is indicated.

4,479,382

## SYSTEM FOR TESTING A TIRE TO AVOID A TORQUE STEER EFFECT

Richard J. Greenhorn, Stow; William R. Dutt, Copley; Leonard A. Vandale, Akron, all of Ohio; Douglas L. Winslow, Kuala Lumpur, Malaysia; David A. Glemming, Akron, Ohio; John S. Muhl, Nortron, Ohio; Michael G. Heisler, Lansing, N.Y., and Jack E. Brown, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 5, 1982, Ser. No. 365,593
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 24 Claims



1. A method of testing a tire in order to reduce a torque steer effect when said tire is used with an automotive vehicle comprising, in combination, the steps of:

inserting said tire between opposed chucks of a measuring device and closing said chucks upon said tire;

inflating said tire;

simultaneously applying a load to said tire and revolving said tire; and

determining an effective rolling radius of said tire as said tire revolves under said load.

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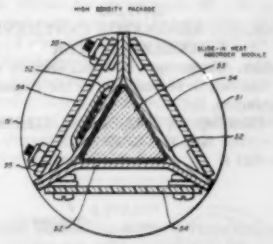
4,479,383

## BOREHOLE APPARATUS FOR THERMAL EQUALIZATION

Frank R. Bravenec, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 18, 1982, Ser. No. 389,659
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 10 Claims



1. Well logging apparatus for use in high temperature boreholes in earth formations, comprising:

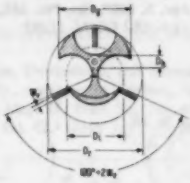
a fluid tight hollow body member sized and adapted for passage through a well borehole, said body member housing interiorly thereto a longitudinally extensive support and mounting member for mounting electrical components thereon, said support and mounting member having a hollow interior construction and containing a heat absorbant material approximately uniformly distributed along its longitudinal length, thereby providing an approximately uniform heat absorbing capability along the length of said support and mounting member for absorbing heat from electrical components in said apparatus.

**4,479,384**

## INTERNAL GATE ROTARY VANE FLUID METER WITH IMPROVED ELEMENT GEOMETRY

**Robert S. Jacobsen, Hatboro, Pa., assignor to The Singer Company, Stamford, Conn.**

**Filed May 13, 1983, Ser. No. 494,208**
**Int. Cl.³ G01F *3/08***
**U.S. Cl. 73—253** **2 Claims**



1. In a fluid meter, the combination of a body having an inlet passage and an outlet passage, a crescent shaped member within the body defining therewith an arcuate channel communicating at opposite ends with said passages, respectively, said body and said crescent also defining an offset circular cavity intersecting the channel between the inlet and outlet passages, a rotor mounted on the body for rotation about an axis within the arcuate channel and the offset cavity, said rotor having an end plate and at least three vanes fixed on the rotor end plate, said vanes being adapted to move by fluid pressure through said arcuate channel and through said portion of said cavity, a gate mounted on the body for rotation about an axis parallel to the rotor axis within said offset cavity, said gate having a periphery provided with pockets therein for reception of the rotor vanes, the number of gate pockets not exceeding the number of rotor vanes, said gate having webs extending radially outward from a central hub between adjacent pockets, means for coupling said rotor to said gate to synchronize the passage of rotor vanes through gate pockets without the vanes contacting the gate webs, said coupling means providing a drive train for gate rotation from the rotor, the outer diameter of said gate being the maximum possible which still allows the crescent to have an arc about the rotor axis which is sufficient to enclose the radial centerlines of any adjacent pair of rotor vanes.

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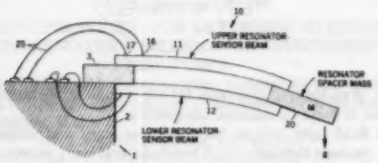
**4,479,385**

## DOUBLE RESONATOR CANTILEVER ACCELEROMETER

**Dale R. Koehler, Albuquerque, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Filed Sep. 23, 1982, Ser. No. 422,515**
**Int. Cl.³ G01P *15/08***
**U.S. Cl. 73—517 R** **7 Claims**




1. An accelerator comprising a base and a first free-standing acceleration sensitive resonator affixed to said base, said resonator consisting of:

a resonator mass;

a first elongate piezoelectric quartz force transducer having one end rigidly fastened to said base and an opposed end rigidly fastened to said mass;

a second substantially identical transducer having one end rigidly fastened to said base and an opposed end rigidly fastened to said mass, each of said ends being spaced from a respective end of said first transducer;

each of said transducers comprising a rectangular beam having a length greater than its width and a width greater than its thickness, said first transducer having a face in the length-width plane which is spaced from and opposing an equivalent face of said second transducer.

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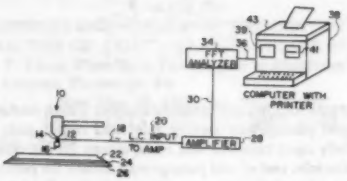
**4,479,386**

## INSULATION BONDING TEST SYSTEM

**James M. Beggs, Washington, D.C.; Garland D. Johnston; Archie D. Coleman, both of Huntsville; Joseph N. Portwood, Decatur; Jerry M. Saunders; John W. Redmon, both of Huntsville, and Allen C. Porter, Madison, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 10, 1983, Ser. No. 465,366**
**Int. Cl.³ G01M *7/00*; G01N *29/04***
**U.S. Cl. 73—582** **14 Claims**




1. A system for testing the bonding of insulation attached to metal comprising:

a hammer for impacting insulation attached to metal, said hammer comprising means for measuring the force with which said hammer strikes said insulation and the time duration of the impact and generating an electrical signal representing said force and said time duration;

conditioning means for transforming said electrical signal by amplifying the voltage, said conditioning means having a high input impedance and a low output impedance; and

means connected to said conditioning means for using said conditioned signal for determining spectral data representing the amplitude and forced period of vibration of mechanical waves set up when said hammer strikes said insulation and transforming said data into data representing an energy spectral density curve for said mechanical waves, said determining means comprising means for showing a visual presentation of an energy spectral density curve;

whereby, a comparison may be made between said energy spectral density durve and a predetermined empirical scale and a determination made as to whether: insulation at the point of impact is well bonded, bonded, or debonded.

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**4,479,387**

## FIXTURE FOR HOLDING TESTING TRANSDUCER

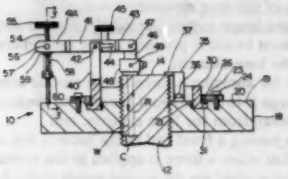
**Thomas A. Wagner, Troy, and Herbert P. Engel, Clifton Park, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Nov. 23, 1982, Ser. No. 443,986**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—622** **21 Claims**

1. A fixture for controlling a testing transducer relative to the end of a circular, elongated workpiece, comprising:

base means securable around the workpiece and a testing transducer engagable against the end of the workpiece;

first means operatively connected to the base for variably positioning the testing transducer radially with respect to the workpiece, and



second means operatively connected to the first means and to the base means for variably providing the contact pressure of the testing transducer against the end of the workpiece.

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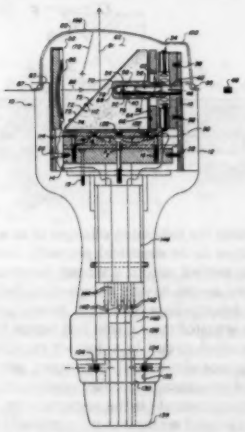
**4,479,388**

## ULTRASOUND TRANSDUCER AND DRIVE SYSTEM

**Terrance Matzak, Verona, Pa., assignor to Dymax Corporation, Pittsburgh, Pa.**

**Filed Sep. 20, 1982, Ser. No. 420,473**
**Int. Cl.³ G01N *29/00***
**U.S. Cl. 73—634** **20 Claims**



10. A system having infinite angular resolution for driving an object that is movable relative to the stator assembly of its driving motor comprising:

said stator assembly having at least two sets of electrically conductive coils, at least one said set being displaced from at least one other set;

a magnet assembly mounted in confronting relationship to said stator assembly and being movable relative thereto, said magnet assembly having a plurality of magnetic poles, movement of said magnet assembly causing corresponding movement of said object;

means for providing a position signal related to the position of said object relative to said stator assembly;

means for processing said position signal to generate continuously varying commutating signals in a number corresponding to the number of said sets of coils;

means for generating a command signal;

means for comparing said position signal with said command signal and thereby generating an error signal;

means for continuously applying said error signal to said commutating signals to alter at least one of their amplitude and polarity; and

means for applying said altered commutating signals to their respective said sets of coils to cause movement of said object to directly follow said command signal in a uniform and continuous motion irrespective of the number of sets of conductive coils and the number of magnetic poles.

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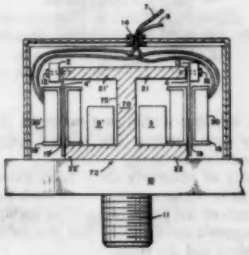
**4,479,389**

## TUNED VIBRATION DETECTOR

**Philip M. Anderson, III, Chatham; Ronald K. Reich, Phillipsburg, both of N.J., and Donald Raskin, New York, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Continuation-in-part of Ser. No. 349,739, Feb. 18, 1982,. This application Sep. 23, 1982, Ser. No. 422,325**
**Int. Cl.³ G01H *1/00***
**U.S. Cl. 73—651** **22 Claims**



1. A vibration sensor for detecting vibrations having preselected frequencies, comprising:

a. a plurality of tuning means each being mechanically resonant with a different preselected vibrational frequency to be detected, and each comprising a frame having a least one mechanical resonant frequency and having at least one cantilevered element extending therefrom;

b. a plurality of positive magnetostriction glassy metal elements, each connected to a different one of said cantilevered elements to undergo a varying tensile stress in response to vibrational movements of said cantilevered elements, and each connected to said different one of said cantilevered elements with a tensile prestress applied to the glass metal element;

c. magnetic biasing means for imparting magnetization to said magnetostrictive elements; and

d. means associated with said magnetostrictive elements for detecting changes in the magnetization thereof due to the varying stresses applied thereto.

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**4,479,390**

## TRANSDUCER FOR MEASURING TORQUE AND/OR SPEED OF ROTATING SHAFT

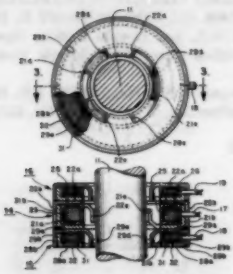
**Edwin J. Meixner, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Jan. 28, 1983, Ser. No. 461,897**
**Int. Cl.³ G01L *3/10***
**U.S. Cl. 73—862.36** **9 Claims**

1. A transducer for sensing a predetermined characteristic of a rotatable shaft and including a primary magnetic assembly, having a primary winding, energized by an applied excitation signal to produce an alternating magnetic field adjacent to and within the shaft, which field is a function of and is modified by the sensed shaft characteristic, and further including first and second secondary magnetic assemblies, having secondary windings, for producing signals in response to the modified magnetic field to provide information signals indicating the

sensed shaft characteristic, each of said magnetic assemblies comprising:

a hollow, ring-shaped magnetic shell encompassing and coaxial with the rotatable shaft and having two sides, a radially outermost rim and a radially innermost rim, the two sides of the shell being closed and joined at the shell's radially outermost rim, while the two sides are separated and the shell is open at the shell's radially innermost rim, the shell thereby having a U-shaped cross-section;



at least one winding within said magnetic shell, the plane defined by each winding turn being perpendicular to the axis of the rotatable shaft;

and a plurality of relatively short poles extending radially inwardly from the innermost rim on each side of the shell, the free ends of the poles being close enough to the shell so that magnetic circuit paths will be established through both the shell and the shaft.

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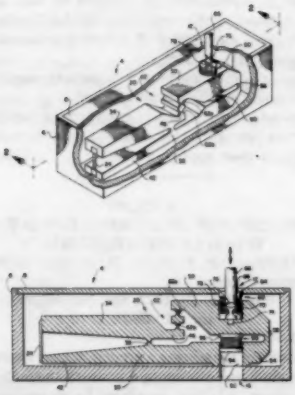
**4,479,391**

**RESONATOR FORCE TRANSDUCER ASSEMBLY**

**Gary J. Banik; Errol EerNisse, both of Salt Lake City, Utah; Walter P. Kistler, Redmond, and Jerome Paros, Kirkland, both of Wash., assignors to Quartex, Inc., Salt Lake City, Utah**

**Filed Apr. 4, 1983, Ser. No. 482,041**
**Int. Cl.³ G01L *1/10***
**U.S. Cl. 73—862.59** **20 Claims**



**16.** A resonator force transducer assembly comprising

an elongate base element,

a first arm disposed generally in parallel with a front portion of the base element,

a first hinge means joining the arm near a rear end thereof to the base element at about the middle thereof to allow pivoting of the arm with respect to the base element wherein front ends of the arm and base element terminate at about the same distance from the first hinge means,

an elongate resonator element attached to the front ends of the arm and base element to extend therebetween,

a second arm disposed generally in parallel with a rear portion of the base element,

a second hinge means joining the second arm and the base element to allow pivoting of the second arm with respect to the base element,

means for applying a force to the second arm in a direction to urge it to pivot about the second hinge means towards or away from the base element, and

means joining a front end of the second arm to the first arm so that when a force is applied to the second arm, a force is also applied via the joining means to the first arm to urge it to pivot about the first hinge means toward or away from the base element to thereby stress the resonator element.

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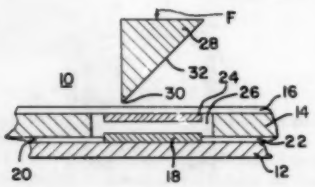
**4,479,392**

**FORCE TRANSDUCER**

**John W. Froeb, Evanston, and Keith A. Engstrom, Rolling Meadows, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Jan. 3, 1983, Ser. No. 455,443**
**Int. Cl.³ H01C *10/10*; G01L *5/16***
**U.S. Cl. 73—862.68** **12 Claims**




**4.** A transducer for indicating changes of an applied physical force by changes in an electrical property comprising a first electrically propertied means, a second electrically propertied means, a spacer means having an aperture therethrough, said spacer being intermediate said first means and said second means, and an actuator means; said first means being connected within an electrical circuit in a manner creating an electrical potential difference across said first means, said second means being in spaced substantially parallel relationship with said first means; said actuator means being responsive to said force to, in turn, urge said second means into progressively increasing area of electrical coupling with said first means through said aperture as said force increasingly, through said actuator, urges said second means toward said first means, whereby said electrical property of said first means is varied proportionally with variance of said force; said first means and said second means being resistive lands.

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**4,479,393**

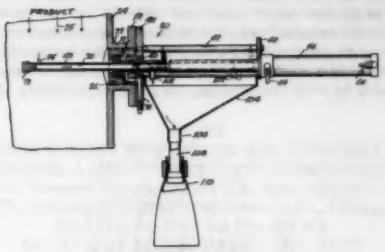
**SAMPLER FOR SLURRIES**

**Bobby D. Shores, Plant City, Fla., assignor to Ben E. Jaeger, Plano, Ill.**

**Filed Apr. 27, 1983, Ser. No. 489,128**
**Int. Cl.³ G01N *1/10***
**U.S. Cl. 73—863.82** **19 Claims**

**1.** Apparatus for obtaining samples of product from a vessel containing the product, comprising a conduit having an inlet for communication with the interior of the vessel and an outlet; valve means operable to establish and interrupt communication between the interior of the vessel and said inlet, whereby when communication is established a sample of product from the

vessel flows through said inlet into said conduit and, through said conduit and to and through said outlet; and means for introducing flushing liquid through said inlet and into said



conduit when said valve means interrupts communication between the interior of the vessel and said inlet to flush any residual sampled product from said conduit.

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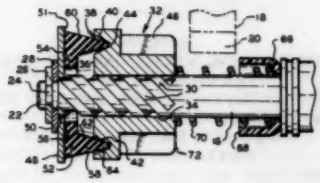
**4,479,394**

## ELECTRIC STARTER WITH CONFINED CUSHION

**Leon D. Greenwood, Okemos, and Clifford L. Dye, Eaton Rapids, both of Mich., assignors to Eaton Stamping Company, Eaton Rapids, Mich.**

**Filed Jun. 18, 1981, Ser. No. 274,815**
**Int. Cl.³ F02N *15/06*; F16D *11/06, 23/00, 13/22***
**U.S. Cl. 74—7 R** **3 Claims**



1. In an electric starter for internal combustion engines including an electric motor having an armature shaft having a helical thread defined thereon, a pinion gear rotatably mounted upon the shaft for axial movement thereto and having a friction surface defined thereon, a nut mounted upon the shaft threaded upon the thread and having a friction surface disposed toward the pinion gear, a compression spring circumscribing the shaft axially biasing the pinion gear toward the nut, and an annular elastomer member circumscribing the shaft and located between the nut and pinion gear having a first friction surface engagable by the nut friction surface and a second surface engagable with the pinion gear friction surface, the improvement comprising, the pinion gear friction surface including a radial surface having an annular axially extending groove concentric to the shaft intersecting said radial surface, said groove including inner and outer axially extending walls and a base, said pinion gear groove inner and outer walls being of a conical configuration converging toward said groove base defining a first included angle, the elastomer member second friction surface including an annular ring concentric to the armature shaft and in radial alignment with said groove defined by axially extending inner and outer surfaces and a nose surface, said ring inner and outer sufaces being conical in configuration converging in the direction of said nose surface defining a second included angle, said nose surface being received within said groove during engine cranking, said second included angle defined by said ring surfaces being less than said first included angle defined by said pinion gear friction surface whereby clearance exists within said pinion gear groove to accommodate expansion of said elastomer member ring during the initial compression of said elastomer member ring, said elastomer member ring being of reduced radial dimension adjacent said nose surface to produce an initial soft cushioning of engagement between the pinion gear and elastomer member, said groove confining said ring nose surface during torque transmission from the elastomer member to the pinion gear.

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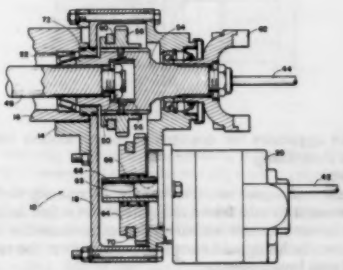
**4,479,395**

## DIFFERENTIAL GEAR HOUSING MOUNTED POWER TAKE-OFF UNIT

**Dale Riley, P.O. Box 709, Eufala, Okla. 74432**

**Filed Sep. 21, 1981, Ser. No. 304,243**
**Int. Cl.³ F16H *37/00, 37/16***
**U.S. Cl. 74—15.84** **3 Claims**



1. A power take-off unit adapted for mounting to a differential gear housing, drive shaft and third member of a rear axle of a rear wheel drive vehicle comprising:

(i) a torque transmitting means adapted to mount directly to said differential gear housing of said rear axle of said rear wheel drive vehicle and adapted to be driven by said drive shaft of said vehicle, wherein said torque transmitting means comprises:

(a) a gear housing adapted to mount to said differential gear housing and adapted to have said hydraulic pump mounted thereto;

(b) a pair of equal diameter, coaxial, splined shafts, one being driven by said drive shaft and the other driving the third member within said differential gear housing; and

(c) a driver gear concentrically displaced about and internally meshed with said splined shafts and adapted to be selectively moved axially with respect to said splined shaft thus transmitting or discontinuing the transmission of torque to the rear drive wheels of said vehicle;

(ii) a hydraulic pump mounted directly to said torque transmitting means; and

(iii) a gear means within said torque transmitting means adapted to selectively drive or not drive said hydraulic pump when said vehicle is either in motion or at rest and wherein said gear means comprises said driver gear internally meshed with said splined shafts, being selectively externally engaged and meshed with a driven gear rotatably coupled to and selectively positioned along the shaft of said hydraulic pump.

**4,479,396**

## PROPULSION SYSTEM

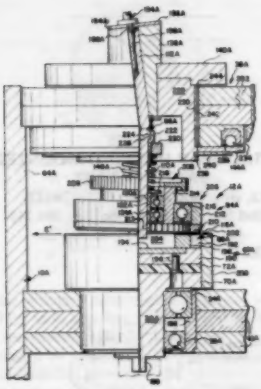
**Fred deWeaver,III, 1403 Tampa Ave., Dayton, Ohio 45408**

**Continuation-in-part of Ser. No. 229,681, Jan. 29, 1981, Pat. No. 4,409,856. This application Jan. 11, 1982, Ser. No. 337,781**

**The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.**

**Int. Cl.³ F16H *27/00***

**U.S. Cl. 74—84 R** **12 Claims**



1. An apparatus for converting rotary motion into linear motion comprising:

a frame;

at least one lower member having a camming surface and mounted to said frame to rotate about a first axis;

said lower member including lower nonmetallic damping means isolating said camming surface from the remainder of said lower member;

at least one upper member positioned above said lower member and mounted to said frame to rotate about a second axis skewed to said first axis;

said upper member including a bottom rim, a portion of which engages said camming surface of said lower member at a point thereon;

said upper member including upper damping means isolating said bottom rim from a remainder of said upper member;

means for rotating said lower member about said first axis; and

means carried by said lower member for driving said upper member such that rotation of said lower member by said rotating means causes said upper member to rotate about said second axis in the same direction as said lower member, thereby creating unbalanced centrifugal forces which result in a first linear force substantially normal to said first axis.

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**4,479,397**

## SHOCK/BRAKE UNIT

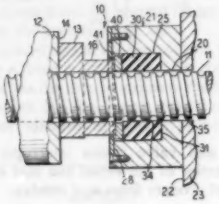
**Ross R. Jelinek, North Tanawanda, and Robert W. Reynolds, Akron, both of N.Y., assignors to Houdaille Industries, Inc., Ft. Lauderdale, Fla.**

**Filed Jun. 24, 1982, Ser. No. 391,875**

**Int. Cl.³ F16H *27/02***

**U.S. Cl. 74—89.15** **13 Claims**

1. A ball screw brake and stop assembly comprising: a rotatable ball screw having an axially movable ball nut thereon, a non-rotatable member assembly surrounding an axial portion of the ball screw having a bore therethrough for receipt of the screw, a counter bore in the member assembly concentric with the bore and open to an axial end of the bore, an elastomeric member received in the counter bore having an at rest inner diameter surface closely spaced from an outer surface of the screw, a confined outer diameter, an axial end surface facing the open end of the counter bore and an opposite axial end surface bottomed against a bottom wall of the counter bore, an axial projection means associated with the nut and movable thereby dimensioned to be insertable into the counter bore, the elastomeric member being axially compressible by insertion of the projection means into the counter bore and radially expandable by axial compression, the radial expansibility of the



elastomeric member being greater than the at rest spacing of the inner diameter thereof from the outer surface of the screw and the elastomeric member having a coefficient of friction effective to retard rotation of the ball screw upon radial expansion into outer surface contact with the ball screw surface and a compression resistance effective to retard axial movement of the nut upon axial compression of the elastomeric member caused by insertion of the projection means into the counter bore.

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**4,479,398**

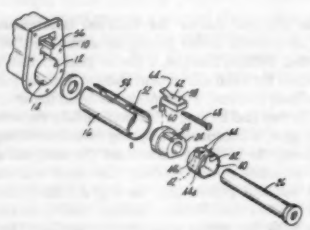
## ANTI-JAMMING MECHANISM FOR LINEAR TRANSLATORY DEVICE

**Shunso F. Watanabe, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 28, 1982, Ser. No. 425,828**

**Int. Cl.³ F16H *27/02, 1/18***

**U.S. Cl. 74—89.15** **8 Claims**



5. An anti-jamming mechanism for a screw drive or the like comprising a tubular stationary housing, a sleeve within the housing having a stepped internal diameter defining lesser and greater diameter surfaces, a screw drive mechanism consisting of a nontranslatory rotatable screw interengaged with a matingly threaded shaft for axially moving the shaft upon rotation of the screw upon holding the shaft against rotation, and for effecting a freewheeling unitary rotary movement of the screw and shaft upon release of the shaft for rotation, and control means to automatically effect the freewheeling movement of the shaft in response to a predetermined axial movement of the shaft in at least one direction, said control means comprising a spring-like collar surrounding and fixed around a portion of the shaft and having a flexible finger at one end projecting radially outwardly, the sleeve having an axially entending slot defining at least one lesser diameter radial wall surface engagable by the finger to prevent rotation of the shaft in one direction and

thereby effect a translatory axial movement of the shaft upon rotation of the screw, axial movement of the shaft and finger beyond the junction of the stepped diameter surfaces to the greater diameter surface removing the finger from engagement with the sleeve radial surface and permitting a freewheeling of the sleeve and collar without axial movement of the shaft, rotation of the screw and shaft in the opposite direction effecting a ratcheting of the finger over the lesser diameter surface.

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**4,479,399**

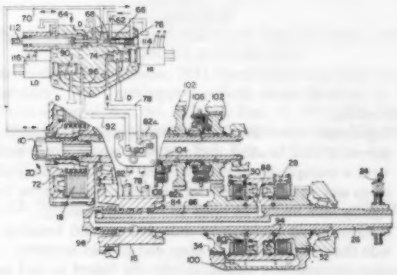
## CHIP SYSTEM TO MONITOR AND DIGITALLY CONTROL A MULTIPLE CLUTCH TRANSMISSION

**Brian C. Narveson, Darien, and Frank R. Bauer, Glenview, both of Ill., assignors to International Harvester Co., Chicago, Ill.**

**Filed May 24, 1982, Ser. No. 381,261**

**Int. Cl.³ F16H** *3/02, 3/38;* **F16D** *25/10, 25/00*

**U.S. Cl. 74—339** **16 Claims**



1. In a transmission with multiple power paths of different effective gear ratios including a plurality of gears and first and second electrically operated clutches cooperating therewith, said transmission further including first and second clutch controlling timer means provided with first and second power relay contacts for electrically controlling the respective first and second electrically operated clutches for shifting the transmission from a first gear ratio to a second gear ratio through application of electricity by the first power relay contacts to the first electrically operated clutch to simultaneously engage the first clutch while the second electrically operated clutch is engaged and then by interruption of electricity applied by the second power relay contacts to the second electrically operated clutch to disengage the second clutch, said contacts applying and interrupting electricity to the respective electrically operated clutches as aforesaid consisting of power relay contacts individual to different ones of the clutches for separate operation so as to free each clutch from necessarily interrupting when the contacts of the other clutch independently interrupt the electricity to the latter:

the improvement comprising first means (**118** open,**120** open,**TM0**,**218**) including timing means (**TM0**) in the first clutch controlling timer means responsive to a status mode of failure of the second clutch (HI) for automatically causing the first power relay contacts (**214**) to interrupt the electricity applied to the first one (LO) of said clutches when the latter have been simultaneously engaged for more than a predetermined time interval, thereby automatically disengaging that particular clutch; and

second means (**120** recloses,**234**,**230**) in the clutch controlling timer means responsive to disengagement of the first electrically operated clutch (LO) for automatically causing the second power relay contacts (**228**) to continue the electricity applied to the second electrically operated clutch (HI) to insure continued engagement of the latter.

**4,479,400**

## RACK AND PINION STEERING GEAR, ESPECIALLY FOR MOTOR VEHICLES

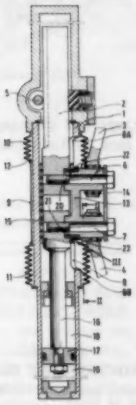
**Wolfgang Rieger, Donzdorf, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany**

**Filed Apr. 13, 1982, Ser. No. 367,881**

**Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118254**

**Int. Cl.³ B62D** *3/12, 5/10*

**U.S. Cl. 74—422** **7 Claims**



1. In a steering mechanism comprising a housing (**1**) and a steering drive member (**2**) therein having reciprocal travel for actuating steering rods wherein said housing has a slot (**8**) therethrough for a slide block (**13**) slidable therein and secured to said drive member for movement thereby to drive steering rods (**3, 4**) and having end surfaces which approach respective end surfaces (**8A, 8B**) of said slot during driving movement of said slide block wherein said slot end surfaces serve as motion limiting stops for said slide block;

the improvement comprising:

a respective cushioning means (**22, 23**) carried on the end surfaces of said slide block and engageable with the respective end surfaces of said slot at the end of travel of said slide block in a respective direction.

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**4,479,401**

## BOLT LOCK DEVICE AND METHOD FOR BOLT LOCKING AND UNLOCKING RELATIVELY MOVABLE PARTS OF A RACK AND PINION JACK-UP RIG

**Mehmet D. Korkut, 2700 Lake Vista Dr., Metairie, La. 70002**

**Filed Oct. 23, 1981, Ser. No. 314,287**

**Int. Cl.³ G05G** *5/06*

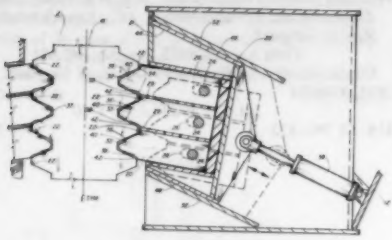
**U.S. Cl. 74—527** **10 Claims**

1. Lock bolt device means for bolt locking a rack and pinion jack-up rig's horizontal and vertical parts from relative vertical motion, comprising:

(a) a frame, having a closed back and an oppositely disposed open forward end, slidably mounted in said horizontal part at an inclined axis of sliding in the range of 25 to 30 degrees above the horizontal for using gravity in sliding said frame down said inclined axis, and with said open forward end extending upwardly opposite said rack mounted on said vertical part;

(b) a plurality of lock bolts flexibly mounted for limited longitudinal and vertical movement in said frame and inclined less than said inclined axis of sliding of said frame and with free ends projecting forwardly from said frame's forward open end toward said rack and adapted to engage and disengage therewith;

(c) power means pivotally connected to said frame and horizontal part of said rig for sliding said frame and lock



lockbolts to engage and disengage said lock bolts' free ends from said rack with minimum operating power and locking effect.

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**4,479,402**

## MICROTOME DRIVE

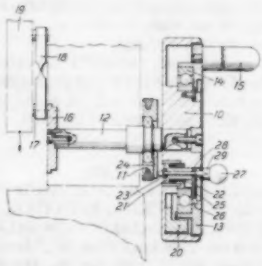
**Artur Reichel, Wetzlar, and Kurt Richter, Ehringshausen-Katzenfurt, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany**

**Filed Jan. 13, 1982, Ser. No. 339,154**

**Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 8100644[U]**

**Int. Cl.³ F16H *35/00*; F16D *21/02*; B23D *5/08***

**U.S. Cl. 74—625** **7 Claims**



1. A microtome drive for adjusting the position of an object carriage in a microtome, comprising:

a drive shaft rotatably mounted in the microtome;

linkage means for adjusting the position of the object carriage in response to rotation of said drive shaft;

a belt-driven pulley rotatably mounted on said drive shaft and adapted to be driven by a drive motor;

a manual drive wheel fixedly attached to said drive shaft at a position adjacent to said belt-driven pulley;

a ring member rotatably mounted on said manual drive wheel for rotation coaxially with respect to said manual drive wheel and said drive shaft, said ring member carrying thereon a manual gripping member; and

means for selectively coupling said manual drive wheel alternatively to either said ring member for manual adjustment of the object carriage or to said belt-driven pulley for automatic adjustment of the object carriage.

**4,479,403**

## HARMONIC-DRIVE ASSEMBLY

**Heinz Marschner, Kressbronna; Fritz Heinemann, Friedrichshafen, and George Marsland, Kressbronn, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany**

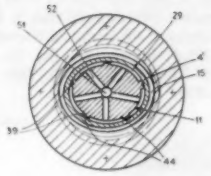
**Division of Ser. No. 202,747, Oct. 31, 1980, Pat. No. 4,425,822.**

**This application Jun. 14, 1983, Ser. No. 504,239**

**Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944123; Nov. 2, 1979, 2944124**

**Int. Cl.³ F16H *37/04***

**U.S. Cl. 74—640** **1 Claim**



1. A harmonic-drive device, comprising:

a housing;

a cup-shaped member with a flexible cylindrical wall disposed in said housing and provided on an outer surface with a multiplicity of elongate gear teeth extending parallel to an axis of symmetry of said wall, said member being rigidly attached at an open end to said housing;

a motion-output component mounted on said housing at a side thereof opposite the open end of said member;

motion-transmission means operatively linked to said member and to said component for transmitting rotary power from said member to said component;

stressing means including a rotatable mechanical wave generator for contacting a surface of said wall and deforming same to assume an elliptical cross-section along a portion of the height of said wall;

drive means operatively connected to said generator for rotating same and thereby a major axis of said elliptical cross-section;

insulating means for sealing said housing; and

reinforcing means in said member for bracing said wall against deformation at points longitudinally spaced from said generator, said reinforcing means including means for introducing a fluid under pressure into said member.

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**4,479,404**

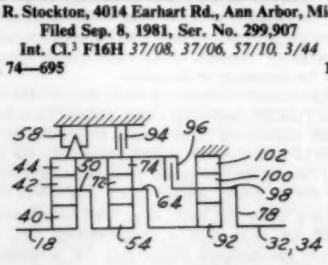
## CONCENTRIC POWERTRAIN FOR ELECTRIC VEHICLE

**Thomas R. Stockton, 4014 Earhart Rd., Ann Arbor, Mich. 48105**

**Filed Sep. 8, 1981, Ser. No. 299,907**

**Int. Cl.³ F16H *37/08, 37/06, 57/10, 3/44***

**U.S. Cl. 74—695** **11 Claims**



1. A power transmission mechanism for an automotive vehicle having multiple speed ratios comprising:

a rotor shaft;

a first stage planetary gear unit including a first sun gear driven by the rotor shaft, a first ring gear, a first set of planet pinions drivably engaged with the first sun gear and

with the first ring gear, and a first pinion carrier having the first set of planet pinions rotatably mounted thereon;

an overrunning brake having a driven element drivably connected to the first ring gear and a braked element fixed against rotation for establishing a one-way driving connection between the first ring gear and the braked element;

a selectively actuated reverse clutch for fixing the first ring gear against rotation;

a second stage planetary gear unit including a second sun gear drivably connected to the first pinion carrier, a second ring gear fixed against rotation, a second set of planet pinions drivably engaged with the second sun gear and with the second ring gear, and a second pinion carrier having the second set of planet pinions rotatably mounted thereon; and

a high speed ratio clutch for establishing and disestablishing a driving connection between the first ring gear and the second pinion carrier.

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**4,479,405**

## APPARATUS FOR CUTTING SAW TEETH INTO SAW BLADES OR SAW BANDS

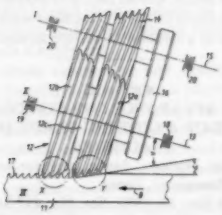
**Erwin Junker, 78 Talstrasse, 7611 Nordrach Baden, Fed. Rep. of Germany**

**Continuation of Ser. No. 272,120, Jun. 10, 1981, Pat. No. 4,434,685. This application Sep. 2, 1983, Ser. No. 528,984**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022292**

**Int. Cl.³ B23D *63/12***

**U.S. Cl. 76—38** **3 Claims**



1. An apparatus for forming a saw blade or a saw band by forming saw teeth in a solid stock moving continuously in a longitudinal direction, said apparatus comprising:

grinding wheel means for grinding away portions of the stock to form saw teeth therein;

said grinding wheel means being mounted for rotation about an axis which is inclined at an acute angle to and which diverges from the direction of movement of the stock; and

said grinding wheel means having a generally frusto-conical configuration and an outer periphery defined by first and second axially distinct helical grinding ribs having different contours, each of said first and second grinding rib comprising means dimensioned for forming identical portions of each successive saw tooth formed in the stock.

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**4,479,406**

## CORK PULLER

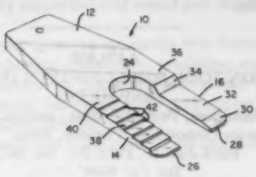
**John V. Shoemaker, III, 1 Shoemaker Dr., Mechanicsburg, Pa. 17055**

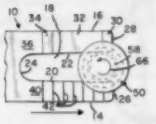
**Filed Feb. 27, 1984, Ser. No. 583,614**

**Int. Cl.³ B67B *7/06***

**U.S. Cl. 81—3.46 A** **6 Claims**

1. A cork puller including a handle, a pair of pry arms extending from one end of the handle, the pry arms having top and bottom surfaces with the bottom arm surfaces lying in a common plane, narrow tips on the free ends of the arms, a cork slot separating the arms, the top to bottom thickness of the arms increasing in a direction from the tips toward the handle, and a plurality of cork engaging teeth on the top surface of one arm only whereby insertion of the cork puller between the lip





of the bottle and a headed cork seated in the bottle simultaneously extracts and rotates the cork.

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**4,479,407**

## METHOD AND APPARATUS FOR PROCESSING INSULATED WIRE

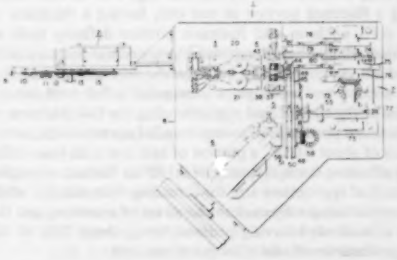
**Hitoshi Mikami, Susono, and Noboru Ito, Kakegawa, both of Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed May 29, 1981, Ser. No. 268,183**

**Claims priority, application Japan, May 30, 1980, 55-71460; May 30, 1980, 55-71461; May 30, 1980, 55-71462; May 30, 1980, 55-71463**

**Int. Cl.³ H01R *43/04*; H02G *1/12***

**U.S. Cl. 81—9.51** **7 Claims**



1. A method of processing an insulated wire comprising the steps of

(a) playing out a long continuous wire coated with insulation covering by a predetermined amount for measuring purposes;

(b) feeding the played out wire by said predetermined amount in a straight line in a first direction;

(c) clamping said fed wire at first and second positions;

(d) cutting the clamped wire at a cutting position between said first and second positions to cut off a short wire;

(e) cutting into the insulation covering of the wires with a pair of insulator cutters on both sides of the cutting position between the first and second positions;

(f) removing the insulation covering between the insulator cutters by pulling the clamped wires away from each other;

(g) trasnferring the clamped short wires in a second direction perpendicular to the first direction; and

(h) repeating the steps (a) to (g) to feed a plurality of short wires along said second direction for wire end processing.

said pulling in step (f) including swinging said plurality of short wires about an axis extending parallel to said second direction.

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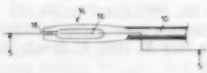
**4,479,408**

## INSERTION TOOL FOR CORD-TYPE TUBELESS TIRE REPAIRING

**Alec W. Nicoichuk, Peabody, Mass., assignor to North Shore Laboratories Corporation, Peabody, Mass.**

**Filed Jun. 11, 1982, Ser. No. 387,544**
**Int. Cl.³ B60C *25/16***
**U.S. Cl. 81—15.7** **2 Claims**



1. An insertion tool for a cord-type repair for tubeless tires comprising a substantially cylindrical, high carbon steel shank having a flattened portion at one end, having a thickness of about 0.1", walls in said flattened portion defining both an elongated axially aligned, narrow, elongated eye and an axially aligned slit communicating between the free end of said flattened portion and said eye, a substantially flat cord-driving pedestal at the base of said eye, extending the full thickness of said flattened portion and having rounded corners each having a radius of about 0.035", a portion of said eye at its base defining an effective stress diameter of 0.130" in the area occupied by a cord of appropriate size for threading into said eye while said cord is being subjected to the stress of insertion, and the width of said cord-driving pedestal being about 77% of the average diameter of said effective stress area.

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**4,479,409**

## OPEN-END RATCHET WRENCH

**John I. Antonius, 3848 SW. 36th Pl., Portland, Oreg. 97221**

**Filed Feb. 7, 1983, Ser. No. 464,393**
**Int. Cl.³ B25B *13/00***
**U.S. Cl. 81—58.3** **8 Claims**

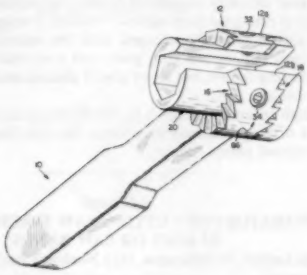
1. An open-end ratchet wrench comprising:

a handle portion joined to a crescent-shaped head portion which head portion has opposed arms terminating in spaced apart ends extending incompletely about an opening which extends axially in the head portion,

a jaw member mounted within said opening and rotatable relative to said head portion, said jaw member having an internal axially extending chamber opening to ends of the jaw member defined by internal wall surfaces adapted nonrotatably to receive a nut,

releasable indent-detent means interposed between the head portion and jaw member accommodating rotation of the jaw member without release of the indent-detent means, and limited axial displacement of the jaw member from the opening in the head portion with partial release of the indent-detent means, and

ratchet means interposed between the head portion and jaw member for imparting rotary movement of the head portion to the jaw member with the head portion rotated in one direction only, said ratchet means comprising an annular row of teeth presented by and projecting axially of the jaw member and a cooperating annular row of teeth



presented by and projecting axially of the head portion at one end thereof engaging the teeth of the jaw member with the head portion rotated in said one direction, said rows of teeth moving to a disengaged position with limited axial displacement of the jaw member and partial release of the indent-detent means to permit rotation of the head portion freely of the jaw member with rotation of the head portion in a direction opposite to said one direction.

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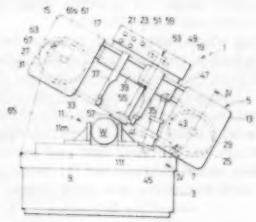
**4,479,410**

## METHOD AND APPARATUS FOR CONTROLLING THE UPPER LIMIT OF A CUTTING BLADE IN CUTTING MACHINES

**Masayuki Taguchi, Hadano, Japan, assignor to Amada Company Limited, Kanagawa, Japan**

**Filed Sep. 13, 1982, Ser. No. 417,349**
**Claims priority, application Japan, Sep. 11, 1981, 56-142208; Aug. 11, 1982, 57-120957[U]**
**Int. Cl.³ B23D *53/04***
**U.S. Cl. 83—13** **8 Claims**



1. A method of controlling the upper or returning height of a cutting blade mounted in a cutting head of a cutting machine, said method comprising the steps of:

(a) actuating a blade starting switch;

(b) detecting the height of said blade when said starting switch is actuated;

(c) storing the detected height of said blade when said starting switch is actuated;

(d) continuously detecting the height of said blade;

(e) comparing the continually detected blade height with the stored value in said memory; and

(f) providing a signal, for stopping the upward movement of

the cutting head means, when the detected height is equal to the stored detected height.

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**4,479,411**

## TONE SIGNAL GENERATING APPARATUS OF ELECTRONIC MUSICAL INSTRUMENTS

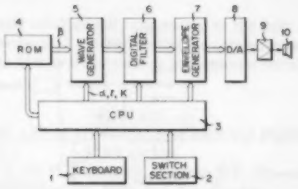
**Masanori Ishibashi, deceased late of Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan by Masayaki Ishibashi, legal representative**

**Filed Dec. 15, 1982, Ser. No. 450,082**

**Claims priority, application Japan, Dec. 22, 1981, 56-208814; Dec. 22, 1981, 56-208815; Dec. 22, 1981, 56-208816; Apr. 8, 1982, 57-57359**

**Int. Cl.³ G10H *1/02, 7/00***

**U.S. Cl. 84—1.01** **19 Claims**




17. A tone signal generating apparatus for an electronic musical instrument, comprising:

means for storing code data indicative of a plurality of musical note frequencies;

means coupled to said storing means for reading out given code data from said storing means according to an operated key on a keyboard;

arithmetic means coupled to said reading out means for obtaining an output comprising a plurality of bits indicative of the note frequency corresponding to the operated key wherein said arithmetic means performs a predetermined arithmetic operation on the read-out code data; and

control means including means for generating a tone signal having a predetermined waveform from said output of said arithmetic means comprising a plurality of bits, means for discriminating the polarity of the amplitude value of the generated tone signal, means for generating a different waveform signal, and means for selectively causing addition and subtraction of said tone signal and different waveform signal depending upon the result of the discrimination.

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**4,479,412**

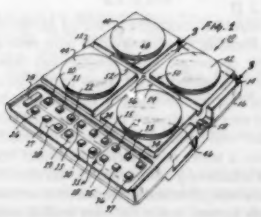
## MULTIPLE DRUM PAD ISOLATION

**Scott S. Klynas, Simi Valley, Calif., assignor to Mattel, Inc., Hawthorne, Calif.**

**Continuation-in-part of Ser. No. 335,985, Dec. 30, 1981, Pat. No. 4,418,598. This application Dec. 23, 1982, Ser. No. 452,576**

**Int. Cl.³ G10H *3/14***

**U.S. Cl. 84—1.04** **6 Claims**



6. A drum pad assembly comprising:

a nested pair of inwardly facing cupped members assembled to form an internal cavity;

means resiliently supporting said nested pair of cupped members;

a resilient coupler spanning the cavity thus formed;

an electro-mechanical transducer, producing an electrical signal in response to mechanical vibrations, said transducer interposed between one of said cupped members and said resilient coupler; and

connecting means providing an electrical connection to said transducer;

said nested pair of cupped members coupling a great portion of the imparted force to said electro-mechanical transducer when one of said cupped members is struck and said nested pair of cupped members are jointly subject to force or vibration.

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**4,479,413**

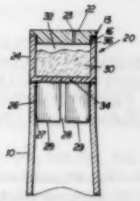
## SAXOPHONE NECK GREASE PLUG

**Juan Novo, 12440 SW. 188 Ter., Miami, Fla. 33177**

**Filed Jul. 18, 1983, Ser. No. 514,651**

**Int. Cl.³ G10D *9/00*; G10G *7/00***

**U.S. Cl. 84—329** **12 Claims**



1. A saxophone neck grease plug for use in storing a saxophone after use comprising:

a body defining an upper portion and a lower portion,

said upper portion defining a hollow cavity and a floor,

said floor spanning the width of the saxophone neck socket,

said hollow cavity having a charge of grease contained therein,

said lower portion having a diameter substantially equal to the diameter of the lip of the saxophone neck socket with a shoulder being defined where the upper and lower portions meet for resting engagement on the lip of the neck socket of the saxophone,

a cap defining a rim spanning the upper portion of the body and a bottom portion equal to the inside dimensions of the hollow cavity of the upper portion sized to be snugly received by the hollow cavity,

said cap having a breather hole defined by a throughhole of a small diameter to permit air to escape when the cap is received by the upper portion.

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**4,479,414**

## DRUM SUPPORT ASSEMBLY

**Ward L. Willis, P.O. Box 95, Breinigsville, Pa. 18031**

**Filed Sep. 20, 1982, Ser. No. 419,984**

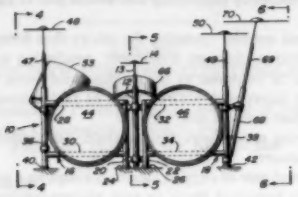
**Int. Cl.³ G10D *13/02***

**U.S. Cl. 84—421** **10 Claims**

9. A multiple drum and cymbol holding assembly comprising in combination:

a support frame adopted for mounting on a bass drum;

a pair of support legs disposed on either side of said frame; and



means to position auxiliary percussion instruments on said support legs, said means foldable to store parallel to said support legs for storage or travel.

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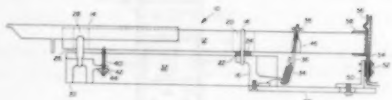
**4,479,415**

**TRACKER ACTION TOUCH FOR KEYS IN A KEYBOARD MUSICAL INSTRUMENT**

**Harold E. Haberstumpf, Emmaus, Pa., assignor to Allen Organ Company, Macungie, Pa.**

**Filed Jan. 6, 1983, Ser. No. 456,061**
**Int. Cl.³ G10C *3/12***
**U.S. Cl. 84—439** **1 Claim**



1. A key action for an electronic musical instrument for simulating a mechanical-type tracker action including a key supported above a key bed by a pivot pin having a guide pin for limiting horizontal movement of the key but allowing vertical movement thereof; a return spring fastened between a key tension adjusting means mounted to the key and said key bed; and a key return limiting means for returning the key, upon release thereof, to its normal or rest position, the improvement comprising: a key switch means located at the distal end of the key having first and second contact means for establishing an electrical contact on the depression of the key mounted in a spaced-apart relation but in close proximity to each other and mounted with said first contact means in touching relation to the distal end of the key, said first contact means having a forward facing protrusion for retarding the vertical movement of the key until sufficient pressure has been exerted on the key to cause a toggling of the key as the retarding force of the first contact means is overcome while said electrical contact is maintained; whereby the key switch means provides both an electrical contact and a tracker action in a single means.

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**4,479,416**

**APPARATUS AND METHOD FOR TRANSCRIBING MUSIC**

**Kevin L. Clague, 1700 Civic Center Dr., #510, Santa Clara, Calif. 95050**

**Filed Aug. 25, 1983, Ser. No. 526,203**
**Int. Cl.³ G10G *3/04***
**U.S. Cl. 84—462** **9 Claims**

1. A music transcription apparatus comprising:

input means for receiving an analog electrical signal representative of musical sounds;

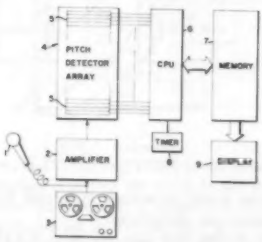
detector means for determining the component pitches and pauses of said analog signal;

timing means for measuring the time at which each pitch or pause in said analog signal commences and its subsequent duration;

memory means for storing as basic data codes indicative of the component pitches and pauses of said analog signal, their respective times of commencement and their durations;

harmonic removal means for eliminating from said basic data all pitches, along with their respective times of commencement and durations, other than the lowest pitch playing at each particular time;

transient removal means for removing from said basic data each transient pitch or pause which is promptly followed by a pitch which is the same as the pitch immediately preceding said transient pitch or pause, for removing said promptly following pitch and for extending the duration of said immediately preceding pitch so that said pitch will




play continuously from the time said immediately preceding pitch originally commenced to the time said promptly following pitch originally ceased, and for replacing all other transient pitches with pauses;

time signature analysis means for generating note and rest data by determining the note or rest of a time duration and position on a conventional music score to properly represent each occurrence of each pitch or pause in the basic data as modified by the harmonic removal means and the transient removal means;

key signature analysis means for generating accidental sign data by determining whether each note in the note and rest data should be preceded by an accidental sign to be properly represented on a conventional music score; and

display means for displaying the note and rest data and the accidental sign data on a conventional music score, thereby generating a transcription of said musical sounds.

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**4,479,417**

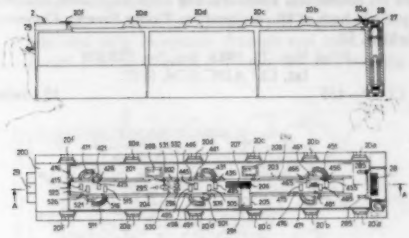
**MISSILE LAUNCHER MODULE IN PARTICULAR FOR AIRCRAFT, WITH GENERAL REVERSIBLE SAFETY DEVICE**

**Alain A. Billard, Muret; André R. Santalucia, Leguevin, and Roland C. Encoyand, Muret, all of France, assignors to Societe E. LaCroix, France**

**Filed Jun. 1, 1982, Ser. No. 383,774**
**Claims priority, application France, Jun. 3, 1981, 81 10975**
**Int. Cl.³ F41F *5/02***
**U.S. Cl. 89—1.5 D** **6 Claims**

1. A missile launcher module carried by an aircraft comprising: a flat wall forming a base provided with male engagement members which cooperate with counterpart female engagement members of a support rod fixed to the aircraft and an electrical connector establishing a connection between the module and the carrying aircraft in the engaged position of the module, said flat wall forming the base of the module defining a central groove, a series of electrical initiators housed within the groove and selectively connected to said electrical connector, the initiators being located opposite counterpart fire-transmission channels formed in the flat base wall in order to terminate respectively at useful charges contained in the module, the central groove also supporting a slide bar having orifices lo-

cated according to the working geometry of the initiators, and an electrical motor electrically connected to the connector for



energization and mechanically connected to the base in order to ensure movement of the bar between a safe position and an armed position in which the orifices are opposite the initiators.

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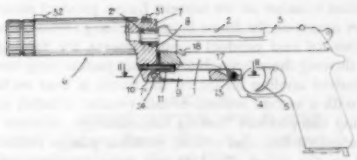
**4,479,418**

## MEANS FOR ATTACHING SILENCERS TO PORTABLE FIREARMS

**Pier C. Beretta, Via P. Beretta 10, Gardone V.T. (Brescia), Italy**

**Filed Sep. 10, 1982, Ser. No. 416,584**
**Claims priority, application Italy, Sep. 30, 1981, 5214 A/81**
**Int. Cl.³ F41C *21/18***
**U.S. Cl. 89—14 D** **8 Claims**



1. Means for attaching a silencer to a portable firearm having a firearm body, a barrel mounted on said firearm body, a firing mechanism associated with said barrel and a trigger guard, said means comprising a mounting body for supporting said silencer and having an axial aperture therein for accepting the forward extremity of said barrel; a pair of arms integral with said mounting body and positioned one on each side thereof and extending parallel to said firearm body toward said trigger guard, the extremities of said arms resting on opposite sides of said trigger guard; a first spine fixedly attached to said mounting body and parallel to said axial aperture and lodging within an opening provided in a forward extremity of said firearm body; a second blocking spine for engaging transversely said arms to said trigger guard, said second spine being positioned perpendicularly to the axis of said first spine and being engaged by spring-type arresting means.

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**4,479,419**

## DUAL CAPACITY RECIPROCATING COMPRESSOR

**Robert W. Wolfe, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 2, 1982, Ser. No. 438,429**
**Int. Cl.³ F04B *23/06*; F01B *7/04***
**U.S. Cl. 92—13.3** **4 Claims**

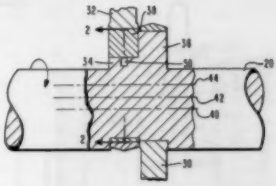
1. In a compressor including at least two reciprocating pistons, the improvement comprising:

a crank shaft with separate crank pin means for each piston, at least one crank pin means having one crank throw and at least another crank pin means having a greater crank throw;

eccentric cam means rotatably mounted on said one crank pin means, said eccentric cam means having an eccentricity equal to said one crank throw;

one connecting rod connecting said cam means to one piston, and another connecting rod connecting said one crank pin means to another piston;

means limiting rotation of said cam on said one crank pin



means to opposite positions of about 180° apart, and in accordance with direction of crank shaft rotation, said cam in one position adding the eccentricity to the throw of said one crank pin means, and said cam in the other position subtracting the eccentricity from the throw of said one crank pin means so that with said cam in said other position said one piston has a zero stroke length.

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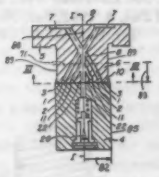
**4,479,420**

## ANTI FRICTION MEANS IN PIVOT MEANS PREFERABLY IN RADIAL PISTON PUMPS, MOTORS OR TRANSMISSIONS

**Karl Eickmann, 2420 Is-hiki, Hayama-machi, Kanagawa-ken, Japan**

**Continuation-in-part of Ser. No. 121,356, Feb. 14, 1980, , said Ser. No. 121,356, is a continuation of Ser. No. 790,822, Apr. 25, 1977, abandoned. This application Feb. 11, 1982, Ser. No. 348,105**
**Int. Cl.³ F01B *31/10***
**U.S. Cl. 92—159** **16 Claims**



1. An arrangement of two bodies, including a first body provided with a bearing bed which coincides with a bearing bed face of part-cylindrical configuration, wherein said arrangement of two bodies includes a second body which forms a part-cylindrical pivot member which is pivotably borne on said bed face of said first body, while said pivot member of said second body has axially relatively to its axis of pivotion a front end and a rear end;

wherein at least two fluid pressure containing recesses are provided substantially parallel to said ends of said member of said second body,

wherein said recesses are distanced inwardly from said ends of said member to form outer sealing portions between the respective recess of said recesses and the respective end of said ends, and,

wherein at least one bearing portion is provided between at least two of said recesses,

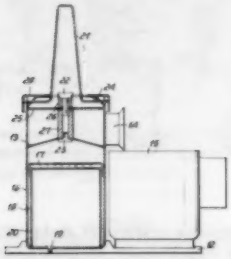
whereby the said at least one bearing portion is subjected to said fluid pressure from the respective recesses on both axial ends of said at least one bearing portion.

4,479,421

## COFFEE-BREW PERCOLATOR

Salvatore Sanvitale, Via Buccella, 6, Trento, Italy

Filed Oct. 25, 1982, Ser. No. 436,754
Claims priority, application Italy, Nov. 2, 1981, 82230 A/81
Int. Cl.³ A47J *31/12, 31/30*
U.S. Cl. 99—303 5 Claims



1. A coffee-brew percolator comprising a vessel, a bottomless boiler arranged within the vessel slidably with respect thereto and having cross dimensions with respect to said vessel such as to define a gap between said bottomless boiler and said vessel, a filter arranged above said bottomless boiler and delimiting a space for receiving coffee powder between said bottomless boiler and said filter, and comprising a further filter engaging the top of said bottomless boiler and having a cross dimension slightly smaller than the cross dimension of said vessel, whereby said further filter is movable together with said bottomless boiler under the action of pressure water.

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4,479,422

## SLIDING AND PIVOTING INVERTIBLE GRILL

Alvin J. Wagstaff, 504 Lawrence Ave., Lafayette, La. 70503

Filed Jun. 4, 1982, Ser. No. 384,973
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—395 13 Claims

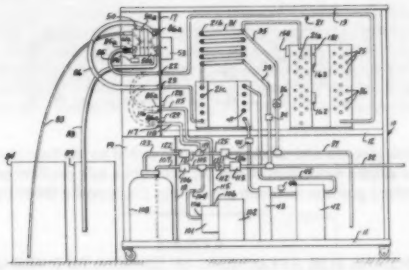
1. A grill including a base structure for stationary support from a suitable support structure, said grill including first and second closely registered side-by-side grill panels, said grill panels including corresponding first and second remote marginal portions and said base structure including first and second remote marginal zones, the opposite ends of said first grill panel first marginal portion and said base including first coacting means slidably supporting said opposite ends from said base for shifting between said base first and second remote marginal zones and angular displacement of said first grill panel relative to said base about a first axis extending between said opposite ends, said first marginal portions of said panels including second coacting means interconnecting said panels for angular displacement relative to each other about a second axis at least closely adjacent and generally paralleling the first axis.

4,479,423

## CONTINUOUS-FLOW TYPE APPARATUS FOR PASTEURIZING BATCHES OF PRODUCT

Steven W. Schwitters, Rockford, and John M. Frazer, Machesney Park, both of Ill., assignors to Taylor Freezer Company, Rockton, Ill.

Filed Nov. 21, 1983, Ser. No. 553,979
Int. Cl.³ A23C *3/04, 9/00*
U.S. Cl. 99—455 13 Claims



1. A continuous-flow type apparatus for pasteurizing batches of liquid product comprising, a support frame, product conduit means defining a continuous flow passage having an inlet fitting at one end and an outlet fitting at its other end mounted at a selected location on the support frame, product pasteurizing heater means on the frame in heat exchange relation with a first section of said product conduit means for heating the product flowing therethrough to product pasteurizing temperature, product cooling means on the frame in heat exchange relation with a second section of said product conduit means for cooling the product flowing therethrough, product feed means including first and second product pumps removably mounted on the frame, the first and second product pumps being of the positive displacement type and each having an inlet and an outlet, a product pump motor for driving the first and second product pumps to substantially equalize flows therethrough, an inlet hose connected to the inlet of the first product pump for connecting the same to a container of unpasteurized product, a first transfer hose connected to the outlet of the first product pump and to the inlet fitting of the product conduit means for feeding unpasteurized product thereto, a second transfer hose connected to the outlet fitting of the product conduit means and to the inlet of the second product pump for pumping pasteurized product from the product conduit means, and an outlet hose connected to the outlet of the second product pump for delivering pasteurized product to a container for pasteurized product.

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4,479,424

## JUICER FOR SEPARATING PULP AND JUICE FROM FRUIT

William L. Carroll, Rossmoor, Calif., assignor to NCC Engineering, Inc., Seal Beach, Calif.

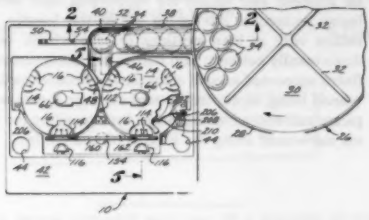
Filed Mar. 11, 1983, Ser. No. 474,541
Int. Cl.³ A23N *1/00*
U.S. Cl. 99—502 13 Claims

1. A juicer comprising:

juicing means for separating pulp and juice from fruit; and

pulper means including a pulp receptacle having an inlet for receiving juice saturated pulp from said juicing means, juice passage means adapted to pass juice from said pulp receptacle and block discharge of pulp from said pulp receptacle, and an outlet for discharge of pulp from said pulp receptacle, said pulper means further including backing means located in said pulp receptacle, bias means biasing said backing means toward a projected position

closing said outlet, said backing means being movable against said bias means into a retracted position opening said outlet, said pulper means further including a pulper piston reciprocable in said pulp receptacle between a retracted position, enabling entry of juice saturated pulp into said pulp receptacle through said inlet, and a projected position closing said inlet for compressing juice



saturated pulp in said pulp receptacle against said backing means whereby juice may pass through said juice passage means, and pulp may be discharged through said outlet upon movement of said backing means against said bias means and into said retracted position responsive to accumulation of compacted pulp against said backing means resulting from successive reciprocations of said pulper piston.

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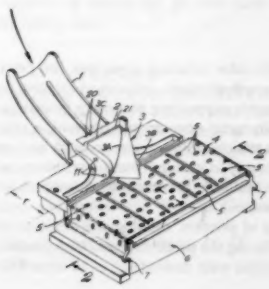
**4,479,425**

## FRUIT CUTTER AND JUICER

**Stewart C. Nelson, Forest Hills, N.Y., assignor to Automatic Orange Juicer Corp., Forest Hills, N.Y.**

**PCT No. PCT/US83/00111, § 371 Date Jan. 24, 1983, § 102(e) Date Jan. 24, 1983**
**PCT Filed Jan. 24, 1983, Ser. No. 522,310**
**Int. Cl.³ A23N *1/00***
**U.S. Cl. 99—507** **8 Claims**



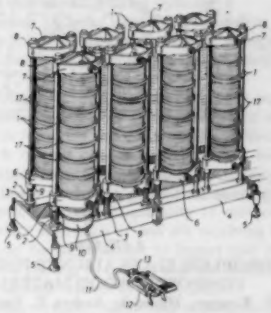
1. In a citrus fruit juice extractor having means for feeding whole citrus fruit to the extractor, means for cutting the fruit, means for expressing the juice from the fruit, means for recovering the expressed juice, and means for discarding the rind of the fruit, the improvement which comprises a chute for feeding individual pieces of fruit against a knife blade, said knife blade being supported on a cam pedestal, the leading edge of the knife blade and the leading edge of the cam pedestal being angled at from 45° to 80° relative to the horizontal, said cam pedestal acting to assure placement of the cut fruit onto said means for expressing the juice from the fruit.

**4,479,426**

## METHOD OF CLOSING, COMPRESSING AND OPENING OF PRESSES FOR MEMBRANE FILTERS AND APPARATUS FOR CARRYING OUT THE METHOD

**Lars Olenfalk, Järfälla, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden**

**Filed Nov. 1, 1982, Ser. No. 438,312**
**Int. Cl.³ B30B *9/06, 13/00***
**U.S. Cl. 100—37** **8 Claims**



1. A method of manipulating filtering apparatus that includes at least two filter assemblies, each of which has two or more vertical columns, extending from a frame member, a stationary upper yoke spanning said columns, a movable lower yoke slidable along and lockable relative to said columns, and several membrane filters with intermediate press plates stacked and compressed between said yokes, said method comprising placing a separate lifting tool common to said filter assemblies below the movable yoke of one of the assemblies, and between that yoke and a frame member of said one assembly, operating the lifting tool to contact the movable yoke of said one assembly, fastening a stopping member to each of the respective columns of said one assembly at a level such that a portion of the stopping member is situated just below an edge of a selected intermediate press plate in a position to support the latter together with all filter membranes and press plates resting thereon, unlocking the movable yoke of said one assembly, lowering that movable yoke together with the membrane filters and press plates situated between that yoke and said selected intermediate press plate, replacing one or more lowered membrane filters, lifting the movable yoke of said one assembly again together with the filter membranes and press plates resting thereon, and, after compression of all the membrane filters and press plates and locking of the movable yoke relative to the columns of said one assembly, releasing the movable yoke of said one assembly from the lifting pressure of the lifting tool, removing the lifting tool from its position below the movable yoke of said one assembly and, instead, placing the lifting tool below the movable yoke of another assembly to be manipulated in the above defined manner.

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**4,479,427**

## BALE TAGGING APPARATUS

**Don D. Floyd, 4658 El Penon Way, San Diego, Calif. 92117, and Lee M. Whittle, P.O. Box 7, Brawley, Calif. 92227**

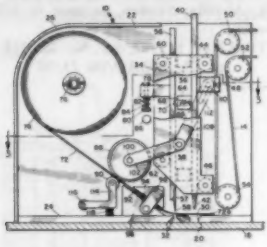
**Filed May 27, 1983, Ser. No. 498,892**
**Int. Cl.³ B30B *15/00***
**U.S. Cl. 100—102** **15 Claims**

1. A tagging apparatus for a baler for inserting tags into a bale, said attachments comprising;

a support member for attachment to a wall of a bale chamber of a baler;

a tag insertion plunger reciprocally mounted on said support member for intermittently engaging and forcing a tag into a bale chamber; and

tag feeding means for intermittently feeding tags to a position for engagement by said plunger, including mounting means for mounting a roll of tags; and



cutting means releasably carried by said plunger to its cutting position for cutting a tag from a roll.

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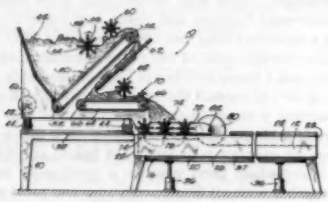
4,479,428

## STATIC DROPLESS FLAKE ALIGNER FOR PRODUCING COMPOSITE WOOD MATERIAL

Gordon P. Krueger, Hancock; Anders E. Lund, and Roy D. Adams, both of Houghton, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 5, 1982, Ser. No. 365,169
Int. Cl.³ B30B 3/02
U.S. Cl. 100—210 5 Claims



1. Apparatus for making a loosely felted mat of elongated wood flakes wherein the wood flakes are deposited with the axes of the wood flakes aligned in mutually parallel relation, the apparatus comprising:

means defining an elongated horizontal surface for supporting the mat,

means positioned in spaced relation above said horizontal surface and for depositing flakes on said surface and for building up a mat of flakes on said surface,

carriage means for supporting said means for depositing for reciprocal movement back and forth along the length of said horizontal surface,

means for causing mutually parallel alignment of said wood flakes as said wood flakes are deposited by said means for depositing, said means for causing parallel alignment of said wood flakes including a plurality of elongated thin planar baffles, said baffles each defining vertical planes and being disposed in mutually spaced apart parallel relation, the baffles each having a lower edge positioned adjacent said supporting surface for maintaining parallel alignment of the wood flakes as they are deposited on the elongated horizontal surface and an upper edge adjacent said means for depositing, and means for causing wood flakes falling across said upper edges of said baffles to move into substantially parallel alignment with said baffles, and including a picker roll having an elongated shaft and a plurality of fingers extending radially outwardly from said shaft, said picker roll being supported by said carriage means above said upper edges of said baffles and for reciprocal movement along the lengths of said upper edges and in a direction parallel to the planes of said baffles, and with at least portions of some of said fingers projecting downwardly between said baffles, and means for causing rotation of said picker roll, and

means for compressing the flakes deposited by the means for depositing, said means for compressing including a plurality of compression wheels supported in spaced apart parallel relation, and means for supporting said wheels for linear reciprocal movement along the lengths of said baffles with at least portions of said wheels extending downwardly between said baffles and compressing wood flakes supported on said elongated horizontal surface, said wheels being supported by said carriage means with said picker roll and with said means for depositing for reciprocal movement along the lengths of said baffles.

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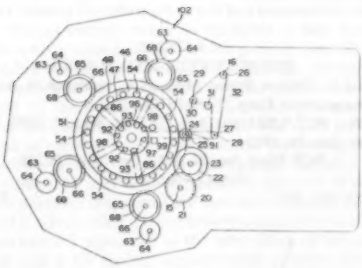
4,479,429

## MULTI-COLOR PRINTING APPARATUS OF SURFACES OF BODIES OF ROTATION

Koichi Haryu, Matteson, Ill., assignor to Yoshino America Corporation, Park Forest South, Ill.

Filed Mar. 22, 1982, Ser. No. 360,838
Int. Cl.³ B41F 17/08
U.S. Cl. 101—38 A 12 Claims



1. A multi-color printing apparatus for printing the outer surfaces of synthetic resin cylindrical articles, comprising:

an index table supporting at evenly spaced positions on the circumferential edge portion thereof, a plurality of holding jigs which are operative to hold said cylindrical articles securely in upright rotating positions, said index table being intermittently rotatable between predetermined stop positions;

a plurality of printers, rotating at a constant circumferential speed, facing the predetermined stop positions for printing said articles with desired colors of ultraviolet-ray set type ink;

a plurality of setting mechanisms oriented perpendicularly to the longitudinal axis of said cylindrical articles at positions downstream of said printers;

a loading mechanism for receiving said cylindrical articles and for loading the article onto said holding jigs;

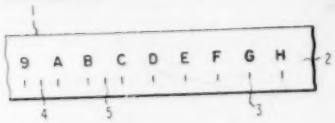
an unloading mechanism for unloading the printed articles from said holding jigs; and

an adjustable drive means for adjusting the circumferential rotational speed of said cylindrical articles to maintain the circumferential rotational speed of said articles equal to the constant circumferential rotational speed of said printers regardless of the diameter of said cylindrical articles.

## 4,479,430
## SYSTEM OF DISCRIMINATING THE KINDS OF TYPE CARRIERS

Hiroshige Nakano; Tsuneki Kobayashi, and Shigenobu Katagiri, all of Ibaragi, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Continuation of Ser. No. 964,111, Nov. 27, 1978,. This application Mar. 20, 1984, Ser. No. 591,368
Claims priority, application Japan, Nov. 26, 1977, 52-141874
Int. Cl.³ B41J 1/20
U.S. Cl. 101—93.14 9 Claims




1. In a printer provided with one of a plurality of interchangeable type carriers, each of said interchangeable type carriers having a predetermined number of characters thereon, and a corresponding group of type marks, the improvement characterized by a system for discriminating among said plurality of interchangeable type carriers comprising:

(a) a synchronizing mark provided on said type carrier at a first preselected position proximate to a first type mark;

(b) a discrimination mark provided on said type carrier at a second preselected position proximate to a second type mark displaced a preselected small number of type marks from said first type mark; said discrimination mark being spaced from said synchronizing mark by a distance considerably less than a length of said type carrier;

(c) means for sensing said synchronizing mark, said type marks, and said discrimination mark and for separating out a sensed synchronizing mark, sensed type marks, and a sensed discrimination mark; and

(d) means responsive to said sensing and separating means for counting the number of type marks between said sensed synchronizing mark and said sensed discrimination mark, said number of type marks counted being indicative of the number of characters on said type carrier, and means for decoding said count of said number of type marks to provide an output signal indicative of said predetermined number of characters on said interchangeable type carrier being used.

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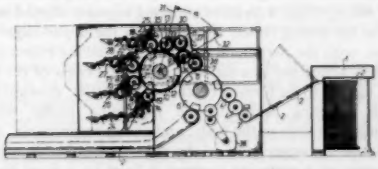
## 4,479,431
## COLLECT-PRINTING UNIT FOR SECURITY PRINTING FOR USE IN A ROTARY PRINTING PRESS

Albrecht J. Germann, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,396
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113055
Int. Cl.³ B41F 7/08; B41L 17/12
U.S. Cl. 101—136 10 Claims



1. A collect-printing unit for security printing a complete multi-color ink coating on a support to be printed in offset printing for use in a rotary printing press, said collect-printing unit comprising:

a first forme cylinder carrying at least one offset printing forme on its periphery;

a first blanket cylinder contacting said forme cylinder and receiving the complete multi-color image to be printed on the support from said forme cylinder;

a second blanket cylinder contacting said forme cylinder and having a plurality of ink receiving blankets affixed to the periphery of said second blanket cylinder;

a counter pressure cylinder contacting said first blanket cylinder, the support to be printed being interposed between said counter pressure cylinder and said first blanket cylinder;

a plurality of first cut-out rollers, each of said cut-out rollers carrying an offset ink contour plate, each of said offset ink contour plates receiving one color of said multi-color ink coating, each of said cut-out rollers further having an inking unit coordinated thereto to supply said one color of said multi-color ink coating to said offset ink contour plate affixed thereto, each of said plurality of cut-out rollers being in contact with each of said ink receiving blankets on said second blanket cylinder to impart said complete multi-color ink coating to each of said ink receiving blankets on said second blanket cylinder; and,

a first ink transfer cylinder contacting said forme cylinder, and a second ink transfer cylinder contacting both said first ink transfer cylinder and said second blanket cylinder, said forme cylinder receiving a double inking formed as a combination of partial ones of said complete multi-color ink coatings that are imparted to successive ones of said ink receiving blankets on said second blanket cylinder, said partial coatings being transferred in registry to said forme cylinder from both said first ink transfer cylinder and said second blanket cylinder, said forme cylinder transferring said complete multi-color ink coating to said first blanket cylinder.

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## 4,479,432
## THICK FILM PRINTING METHOD

Tatsuo Masaki, Tanashi; Toyoshi Nishimoto, Tokyo, and Kiyoshi Masui, Asaka, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Continuation-in-part of Ser. No. 149,914, May 15, 1980, abandoned. This application Aug. 6, 1982, Ser. No. 405,722
Int. Cl.³ B41F 3/36, 29/02
U.S. Cl. 101—170 31 Claims

1. An intaglio offset thick film printing method comprising the steps of:

providing first and second intaglio plates each having an ink receptacle of greater than 10 microns in depth, the pattern of each of said ink receptacles being of the same shape and each corresponding to a predetermined pattern to be printed, and said first and second intaglio plates being arranged in predetermined relationships with respect to a material to be printed;

providing a transfer cylinder for transferring ink from said first and second intaglio plates to said transfer cylinder, said transfer cylinder having a surface transfer layer of a material selected from the group consisting of fluorine

compounds and silicone compounds to impart separability to the surface of said transfer cylinder, and a resilient layer arranged beneath said transfer layer and having a rubber hardness of less than 30° Shore A;

transferring ink from said first intaglio plate to said transfer cylinder at a pressure of less than 10 kg/cm$^2$ and at a transferring velocity of less than 100 mm/sec to form a first ink pattern in a first position on said transfer layer of said transfer cylinder, said first ink pattern on said transfer layer corresponding to said predetermined pattern of said ink receptacle in said first intaglio plate;

printing said first ink pattern formed on said transfer layer of said transfer cylinder onto said material to be printed;

shifting the position of said transfer layer with respect to said ink receptacles in said first and second intaglio plates without altering the positional relationships between said respective first and second intaglio plates and said material to be printed; and

carrying out a superposition printing on said material to be printed by repeating said transferring and printing steps with said shifted transfer layer and with said second intaglio plate so that (i) ink from said second intaglio plate is transferred to said transfer cylinder to form a second ink pattern in a second position on said transfer layer of said transfer cylinder, said second ink pattern on said transfer layer corresponding to said first ink pattern and said second position on said transfer layer being displaced from said first position of said first ink pattern on said transfer layer, and (ii) said second ink pattern is then printed onto said material to be printed in superposition to said first ink pattern printed on said material to be printed.

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**4,479,433**

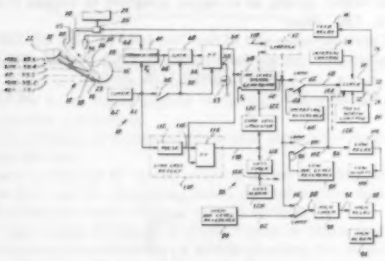
## INK LEVEL CONTROL

**John MacPhee, Rowayton, and Peter Van Raalte, Wilton, both of Conn., assignors to Baldwin-Gegenheimer Corporation, Stamford, Conn.**

**Continuation of Ser. No. 898,925, Mar. 21, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,665**

**Int. Cl.$^3$ B41F *31/02***

**U.S. Cl. 101—364** **15 Claims**



1. An apparatus for automatically controlling the level of ink in an ink fountain used in a printing press by regulating the feed of ink from a supply through a valve to the fountain comprising

ultrasonic ink level sensing means remotely spaced from the ink fountain for directing ultrasonic pulses at the ink fountain to generate an echo signal representative of ultrasonic returns from the surface of the ink;

means responsive to the echo signal for generating a measured ink level signal indicative of the operating level of ink in the ink fountain;

means for producing an operating ink level reference signal representative of a desired ink level in the fountain;

means for comparing the measured ink level signal with the operating ink level reference signal to generate an ink feed signal when the ink level in the fountain drops below the operating level;

means repsonsive to the ink feed signal for generating ink feed pulses spaced by the intervals of a predetermined duration selected commensurate with the time period needed to enable ink supplied during a preceding pulse to register a change in the measured ink level signal and enabling the flow of ink through said valve to the ink fountain during said ink feed pulses;

means for detecting when an echo signal fails to be generated in response to an ultrasonic pulse directed at the ink fountain and producing an echo loss signal indicative thereof and applying said echo loss signal to effectively inhibit the flow of ink through said valve to the ink fountain.

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**4,479,434**

## INK FOUNTAIN, INCORPORATING INDIVIDUALLY REGULATED METERING SEGMENTS, FOR A PRINTING MACHINE

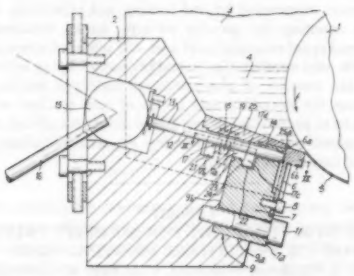
**Michel Armelin, Londres, England, assignor to Societe anonyme dite: Machines Chambon, Orleans, France**

**Filed Feb. 6, 1984, Ser. No. 577,486**

**Claims priority, application France, Feb. 8, 1983, 83 01945**

**Int. Cl.$^3$ B41F *31/04*; B41L *27/06***

**U.S. Cl. 101—365** **10 Claims**



1. An ink fountain, incorporating individually regulated metering segment, for a printing machine, comprising a vat containing ink and delimited, on one side, by a horizontal inking roller and, on the other side, by a transversely extending body, as well as by two vertical, lateral cheeks, the body of the ink fountain bearing, in the vicinity of the peripheral surface of the inking roller, a series of metering segment aligned in parallel to the inking roller, and of which the upper edges determine, with the peripheral surface of the inking roller, gaps of widths adjustable as a function of the thickness of the film of ink having to be formed on the inking roller, downstream of each metering segment, and regulating pusher elements mounted to slide in the body, and acting respectively, at their ends, on the upper parts of the individual metering segments, wherein each metering segment is fixed on a front face of a common support block itself removably mounted on the body, this block being pierced, in its upper part, with holes through which extend the pusher elements acting on the segments and adapted to be dismantled jointly with segments which it bears.

**4,479,435**

## DEVICE FOR FIXING BY SUCTION AN OFFSET PRINTING PLATE OR LIKE PLATE IN PLANAR STATE

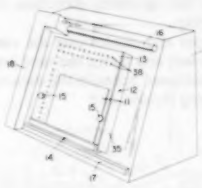
**Hideo Takeuchi, Shiroi; Satoru Horiguchi, Tsurugashima, and Kenichi Mizuno, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 310,774, Oct. 13, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 515,885**

**Claims priority, application Japan, Oct. 17, 1980, 55-145398; Oct. 17, 1980, 55-145399; Oct. 18, 1980, 55-145920; Oct. 28, 1980, 55-151022**

**Int. Cl.³ B41F** *27/00*

**U.S. Cl. 101—382 MV** **5 Claims**



1. A device for measuring the area of a printing image or pattern on a printing plate for an offset printing press, said device comprising:

an inspection head having an optical measuring instrument such as a sensor for detecting the darkness/lightness of the printing image or pattern;

a guide means for guiding the inspection head over the printing plate fixed to a table;

a first casing means, the interior of which is partitioned in a grid-like manner and formed into a plurality of small compartments having open front faces lying in a single plane, said grid-like partition walls being formed integrally with the first casing means by a casting process;

a second casing means surrounding a manifold;

a partition plate interposed between said first and second casing means and between said first casing means and said manifold, said partition plate thereby separating said first casing means from both said second casing means and said manifold;

said partition plate comprising a plurality of valve ports communicating said manifold with said plurality of small compartments within said first casing means;

an elastic valve plate disposed on said partition plate;

said elastic valve plate comprising a plurality of elastic valves each formed from the material of said valve plate and integral at one edge with said valve plate by making at least one cut in said valve plate to form said valve and bending said valve at said point where said valve is integral with said plate;

said elastic valves, each disposed within one of said small compartments in said first casing means;

said elastic valves, each having a member substantially disposed over a valve port in the partition plate for closing a valve port in the partition plate;

a punching plate having a great number of punching holes and fixed to the first casing means so as to cover the open front faces of the compartments, said punching plate forming a part of the table;

a negative pressure source connected by way of the valve ports to the respective compartments and operating to apply suction to all valve plate parts, whereby the printing plate can be fixed on the front side of the punching plate, the valve ports of the compartments covered by the printing plate being designed to be held in an opened state, and the valve plate parts of the compartments not thus covered being designed to be automatically closed by the suction;

a bottom positioning device, for positioning the lower edge of the printing plate, provided at the lower part of the punching plate;

a side positioning device, for positioning the sides of the printing plate, provided in at least one lateral edge part of the punching plate.

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**4,479,436**

## DEVICE FOR IGNITING SAFETY FUSE

**Douglas G. Wilson, 11 Edward St., Upper Ferntree Gully, Vic., 3156, Australia**

**Filed Nov. 12, 1982, Ser. No. 441,151**

**Claims priority, application Australia, Jan. 15, 1982, PF2298**

**Int. Cl.³ F42B** *3/10*

**U.S. Cl. 102—275.11** **6 Claims**

1. A device for igniting an article, said device having a body portion, a chamber block received in said body portion, said chamber block being movable relative to said body portion, said chamber block having a chamber for receiving an igniter, and said device having an aperture for receiving an article therein or adjacent to which an article can be located, said chamber block being movable from one position in which an igniter can be loaded into the chamber to a second position in which an igniter loaded in said chamber can be fired, the chamber and aperture being in communication when the chamber block is in the second position, firing means for firing an igniter loaded in said chamber to thereby ignite an article received in said aperture, and retaining means for retaining an article in the aperture, said retaining means comprising an elongate jaw open at one end and provided with a cutting edge so that an article can be forced into the jaw and the cutting edge will cut into an article to retain an article.

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**4,479,437**

## EXPLOSIVE MINE

**James M. Buick, Stockport, England, assignor to Ferranti Limited, Cheshire, England**

**Filed Dec. 21, 1981, Ser. No. 333,061**

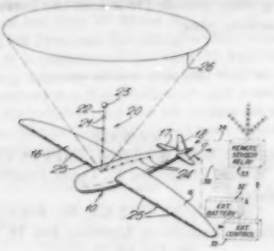
**Claims priority, application United Kingdom, Dec. 29, 1980, 8040893**

**Int. Cl.³ F42B** *22/20*

**U.S. Cl. 102—411** **52 Claims**

1. A marine mine arranged to have a buoyancy state in which the force of gravity and buoyancy act on the mine in a vertical direction to move the mine through the water and including control means operable to control guidance surfaces

projecting from the mine to impart a lateral gliding movement to the mine to steer it to intercept a target and return the mine



to a launch station if undetonated by the target for use when another potential target is detected.

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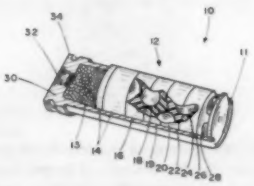
4,479,438

## SABOTED SHOT

**Stephen J. Bilsbury, Bethalto, Ill., assignor to Olin Corporation, Stamford, Conn.**

**Filed Feb. 2, 1983, Ser. No. 463,233**
**Int. Cl.³ F42B *7/02***
**U.S. Cl. 102—454** **5 Claims**



1. A sphericity protective sabot for shot pellets of a single shot size of at least 0.30" diameter, which sabot comprises:

a first cylindrical wafer of low density material having hemispherical dimples on upper and lower surfaces thereof, each said dimples conforming to and adapted to receive and surround the lower or upper portion, respectively, of one of said shot pellets whereby to help maintain the sphericity of said shot pellets when fired through a non-rifled barrel; and

a second cylindrical wafer identical to said first wafer and adapted to stack coaxially atop said first wafer, the dimples on the lower surface of said second wafer being adapted to be aligned with said dimples in the upper surface of said first wafer whereby to define a spherical cavity adapted to surround and protect said shot during said firing.

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4,479,439

## MOBILE ARRANGEMENT AND METHOD FOR IMPROVING A TRACK BED

**Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria**

**Filed Nov. 1, 1982, Ser. No. 438,354**
**Claims priority, application Austria, Dec. 22, 1981, 5525/81**
**Int. Cl.³ E01B *27/10***
**U.S. Cl. 104—7 R** **21 Claims**

1. A mobile arrangement for continuously laying a sand layer between a subgrade and ballast of a track bed in a construction section of the track, which comprises a work vehicle supported on undercarriages mounting the vehicle for mobility on the track in an operating direction, the track section extending between the undercarriages and the vehicle bridging the track section, the work vehicle comprising

(a) ballast excavating chain including

(1) a chain part receiving the excavated ballast,

(b) a first conveyor means arranged to receive the excavated ballast from the chain and to convey the excavated ballast,

(c) a second conveyor means for conveying ballast to the track section in the operating direction, the second conveyor means having

(1) an output end discharging the conveyed ballast in the track section,

(d) a device for planing the sand layer, the planing device leading said output end in the operating direction, and

(2) a third conveyor means for conveying sand to the track section in the operating direction, the third conveyor means having

(1) an output end discharging the conveyed sand in the track section and laying the sand layer, said output end being positioned between the excavating chain part and the planing device, and

(2) the second and third conveyor means in their entirety trailing the chain part in the operating direction.

18. A method of improving a track bed comprising a layer of ballast disposed on a subgrade by laying a protective layer of sand between the subgrade and the ballast in a construction section of the track, which comprises the following steps:

(a) continuously moving a work vehicle bridging the track section on and along the track in an operating direction,

(b) removing the ballast layer in the track section while the work vehicle is continuously moved,

(c) separately conveying sand and ballast to the track section in the operating direction,

(d) laying the layer of sand on the subgrade and the layer of ballast on the laid layer of sand by distributing the conveyed sand and ballast over the entire width of the track bed by pivoting separate conveyor bands respectively conveying the sand and ballast in said direction,

(e) planing the laid layer of sand before the ballast is distributed thereover, and

(f) compacting the layer of ballast.

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4,479,440

## RAIL CLIP DRIVING APPARATUS

**Martin A. Burr, Sheffield; Brian G. Conroy, and Maurice Spencer, both of Worksop, all of England, assignors to Pandrol Limited, London, England**

**Filed Nov. 9, 1981, Ser. No. 319,425**
**Claims priority, application United Kingdom, Nov. 10, 1980, 8036074; Mar. 6, 1981, 8107049; Jun. 9, 1981, 8117644**
**Int. Cl.³ E01B *29/24***
**U.S. Cl. 104—17 A** **22 Claims**

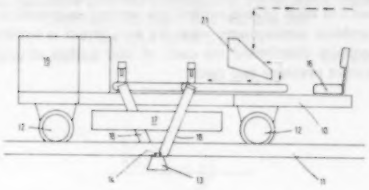
1. A rail clip fastening vehicle which is arranged to run on at least one rail of a railway track and to drive e-shaped rail clips into housings on either side of the rail in order to hold-down the rail, each clip having a first end which forms a centre leg of the clip to be received by a respective housing and a second end spaced from the first end and extending in an opposite direction relative thereto, and the vehicle comprising:

an upright slideway mounted on the vehicle and constructed to receive a stack of e-shaped rail clips, with their centre legs substantially horizontal, and having a clip-discharge outlet at its lower end;

a guiding part arranged in the slideway to project between the first and second ends of the clips of the stack and

thereby guide the descent of the clips to the discharge outlet;

and a clip driver movable through the discharge outlet to drive the lowermost clip of the stack into one of said housings, the clip driver being shaped to engage with the



second end and with a curved arched portion of the clip adjacent to the first end in order to drive the first end into the housing, and withdrawal of the clip driver permitting the next lowest clip of the stack to descend to the discharge outlet.

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**4,479,441**

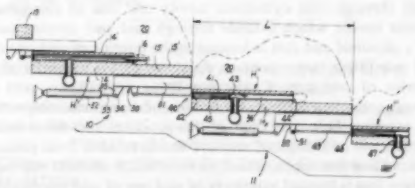
**STEPPED HEARTH INCINERATOR WITH POSITIVE CLEAN-OUT OF AIR FEED-TUBES**

**John S. Somodi, Olmsted Falls, Ohio, assignor to Enercon Systems, Incorporated, Cleveland, Ohio**

**Filed Mar. 13, 1984, Ser. No. 588,966**

**Int. Cl.³ F23G *5/00***

**U.S. Cl. 110—257** **18 Claims**



1. In an incinerator having a combustion chamber for the controlled combustion of waste, the improvement comprising,

(a) a floor of refractory material comprising plural descendingly stepped hearths, and,

(b) clean-out means protectively shielded against deterioration due to the environment of said combustion chamber, said clean-out means comprising,

(i) plural feed-tubes through which gas for supporting combustion of said waste is injected into it, said tubes being disposed longitudinally under the upper surface of a hearth substantially coextensively therewith,

(ii) feed-stubs for conducting said gas to said feed-tubes, said feed-stubs communicating at an angle relative to said feed-tubes, and,

(iii) a clean-out piston slidably reciprocably disposed in a feed-tube, said piston being drivingly connected to

(iv) a first actuating means for reciprocating said piston at preselected intervals with a stroke having a length sufficient to advance said piston into said waste so as to clean out said feed-tube, remove debris plugging the mouth of said feed-tube, provide a void in the waste for distribution of air, and, to retract said piston in said feed-tube to a position anterior of said angle so as to permit flow of said gas to permeate said waste and facilitate combustion thereof.

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**4,479,442**

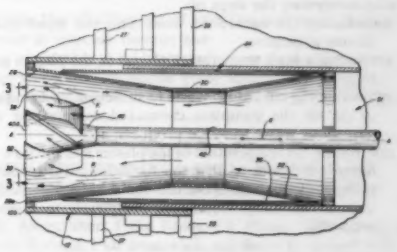
**VENTURI BURNER NOZZLE FOR PULVERIZED COAL**

**Daniel C. Itse, Worcester, and Craig A. Penterson, Sutton, both of Mass., assignors to Riley Stoker Corporation, Worcester, Mass.**

**Continuation of Ser. No. 333,910, Dec. 23, 1981, abandoned. This application Feb. 23, 1983, Ser. No. 469,019**

**Int. Cl.³ F23K *5/00***

**U.S. Cl. 110—261** **9 Claims**



1. A burner for pulverized coal and other fuels comprising:

tubular nozzle means having an inlet for receiving a primary flowing stream of coal/air mixture and an outlet end for discharging said stream into a the combustion zone of a furnace for burning;

annular, venturi-like flow constrictor means in said nozzle means coaxially disposed adjacent said outlet end, said flow constrictor means having a divergent flow section with a maximum diameter outlet adjacent said outlet end of said nozzle means and a convergent flow section upstream thereof for more evenly distributing said pulverized coal in the central portion of said stream;

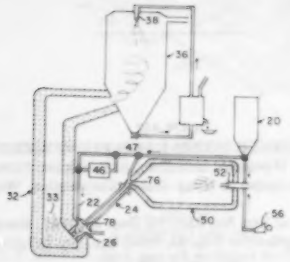
flow spreader means mounted in coaxial alignment in said divergent flow section for adjustable axial movement in said nozzle means, said spreader means having an imperforate conical wall surface with a maximum diameter, open end adjacent said outlet, said imperforate wall surface cooperating with wall surfaces of said divergent flow section to form a diverging annular-shaped flow passage; and

swirl vane means positioned in said passage between said spreader means and surfaces of said divergent flow section for imparting a swirling action to stabilize the flow pattern of said coal/air stream discharged into said combustion zone, said stabilized discharge flow providing a high temperature reducing zone adjacent said open end of said flow spreader means drawing at least some combustion products back toward said spreader means whereby volatiles in said coal are driven off and burned in a reducing atmosphere thereby reducing the formation of oxides of nitrogen by said burner.

## 4,479,443
## METHOD AND APPARATUS FOR THERMAL DECOMPOSITION OF STABLE COMPOUNDS

**Inge Faldt, Tibbarps gard, S-267 00 Bjuv, and Leif Bjorklund, Hudiksvallsgatan 7, S-252 51 Helsingborg, both of Sweden**

**Continuation-in-part of Ser. No. 359,665, Mar. 8, 1982, abandoned. This application May 28, 1982, Ser. No. 383,226**
**Int. Cl.³ F23G *3/00***
**U.S. Cl. 110—346** **37 Claims**



1. A method for the thermal decomposition of hazardous waste comprising the steps of:

introducing the hazardous waste into the input end of a plasma generator;

producing a high temperature plasma in the plasma generator;

subjecting the hazardous waste to sufficient oxidizing agents to permit the complete thermal decomposition of the hazardous waste to stable products; and

controlling the temperature of the plasma and the flow of the hazardous waste so that the hazardous waste reaches a sufficiently high temperature for a sufficient period of time to thermally decompose completely to stable final products.

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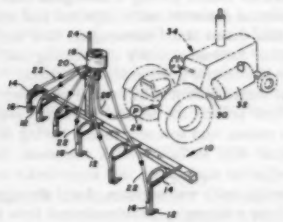
## 4,479,444
## MANOMETER APPARATUS AND SYSTEM FOR DISTRIBUTION OF LIQUID FERTILIZERS

**Harry H. Takata, Minneapolis, Minn., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.**

**Filed Sep. 30, 1982, Ser. No. 431,160**
**Int. Cl.³ A01C *23/02***
**U.S. Cl. 111—7** **4 Claims**



1. A distributor manifold for liquid and suspension fertilizers comprising in combination,

a closed container;

inlet means receiving a fertilizer pumped from a supply tank and including a replaceable liquid metering disc having an aperture formed therethrough of a first predetermined size and shape for regulating the pressure at which said fertilizer is supplied to said container;

a plurality of liquid outlets at the bottom of said container, each containing a replaceable liquid metering disc having an aperture of a second predetermined size and shape, the combination of said inlet and outlet discs providing a range of possible distribution rates, each distribution rate depending upon the pressure internal to said distributer;

a visual direct reading manometer vented to the atmosphere and extending upwardly from the top of said container for displaying the pressure interior thereto; and

means in each of said outlets for venting said outlets to the ambient atmosphere, whereby said liquid is substantially equally distributed via each of said outlets at a uniform outlet pressure and rate.

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## 4,479,445
## ADJUSTABLE EMBROIDERING TOOL

**William H. Walker, Garden City, S.C., assignor to Elwood D. Rexroat and Shirley J. Rexroat, both of Sanford, Fla.**

**Filed Apr. 7, 1983, Ser. No. 482,779**
**Int. Cl.³ D05C *15/06***
**U.S. Cl. 112—80** **6 Claims**

1. An embroidering tool comprising a pair of elongated interfitting components that have a common axis and are relatively rotatable about said axis, one of said components being a unitary structure molded from plastic material and having opposite ends, an interior wall which defines an elongated coaxially arranged cylindrical cavity that opens to the exterior of said one component at one of said opposite ends, and an end opening that communicates with the cylindrical cavity and is coaxial therewith at the other of said opposite ends, the other of said interfitting components being arranged so that it extends through said cylindrical cavity and has an elongated tubular needle which extends through said end opening and has a proximal end that is located in the interior of said one of said interfitting components, a distal end that is located at the exterior of said one of said interfitting components, and a passage extending through the needle and communicating with the exterior thereof at each of the proximal and distal ends thereof, and an elongated member that is molded from plastic material and has opposite end portions which include one end portion that is located exteriorly of said one of said interfitting components at said one of said opposite ends thereof, and another end portion that is located in the interior of said one of said interfitting components at the other of said opposite ends, and an exterior cylindrical wall that extends between said opposite end portions, said proximal end being encased in the plastic material of the other end portion of said elongated member, said member having a passage which extends axially along said common axis and communicates with the needle passage at the proximal end thereof and with the exterior of said other of said interfitting components through said one end portion of said elongated member, said exterior cylindrical wall having a screw thread, said interior wall having a protuberance that is engaged by said screw thread, and said screw thread and protuberance being so adapted and arranged that such relative rotation of said interfitting components causes relative movement of said interfitting components along said axis.

**4,479,446**

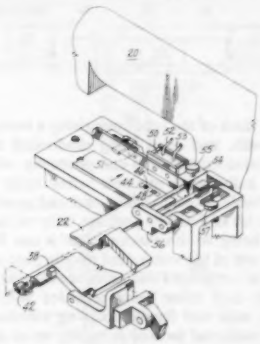
## SEWING MACHINE SYSTEM HAVING AUTOMATIC IDENTIFICATION AND PROCESSING OF MOUNTED WORK

**Herbert Johnson; Richard M. Elliott, both of Beverly; Donald F. Herdeg, So. Hamilton, and Alan M. Peck, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.**

**Filed May 22, 1981, Ser. No. 266,298**

**Int. Cl.³ D05B *21/00***

**U.S. Cl. 112—121.12** **102 Claims**



**99.** A system for automatically sewing one or more predefined stitch patterns on a plurality of workpieces wherein the plurality of workpieces are arranged into one or more groups according to which of the predefined stitch patterns are to be sewn thereon and each group is given a separate identification that can be automatically sensed, the identification appearing in association with at least one workpiece holder for holding a workpiece belonging to the group, said system comprising:

means for automatically sensing the identification appearing in association with each workpiece holder so as to thereby identify the group to which the workpiece being held therein belongs;

means for accessing an assigned stitch pattern in response to the sensing of the identification appearing in association with each workpiece holder; and

means for automatically sewing the assigned stitch pattern on the workpiece.

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**4,479,447**

## METHOD AND APPARATUS FOR SEWING ON A TUBULAR WORKPIECE EDGE

**Günter H. Rohr, Hemmingen, Fed. Rep. of Germany, assignor to Union Special GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 23, 1982, Ser. No. 391,332**

**Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125125**

**Int. Cl.³ D05B *35/02***

**U.S. Cl. 112—141** **12 Claims**

**1.** In combination with an automatic sewing machine having a presser mechanism including a presser foot, a device for folding back the marginal edge of a tubular workpiece, stitch forming means adapted to operate on the folded edge of the workpiece, mechanism for supporting and linearly feeding the workpiece edge to the stitch forming means, work engagable guide means cooperative with the support and feeding mechanism to position the workpiece edge, and a control device for said automatic sewing machine, said control device comprising:

an array of sensor means including a first sensor means being disposed in advance of the stitch forming means in the direction of sewing and laterally spaced therefrom in a position corresponding substantially to the nominal position of an unfolded workpiece edge, a second sensor means being laterally disposed relative to said stitch forming means in a position corresponding substantially to the nominal position of a folded workpiece edge, a third sensor means disposed between said first and second sensor means for detecting the transition of the workpiece edge between unfolded and folded positions and for directing the effectiveness of said first and second sensor means in response thereto; and

means responsive to said array of sensor means for controlling said work engagable guide means and sewing machine operation.

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**4,479,448**

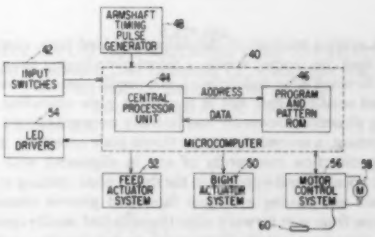
## NEEDLE POSITIONING ARRANGEMENT IN AN ELECTRONICALLY CONTROLLED HOUSEHOLD SEWING MACHINE

**Gary D. Jones, Short Hills; Leonard I. Horey, West Orange; Marvin Kurland, East Brunswick, and Bruce E. Arnold, Clinton, all of N.J., assignors to The Singer Company, Stamford, Conn.**

**Filed Nov. 9, 1983, Ser. No. 550,165**

**Int. Cl.³ D05B *69/22***

**U.S. Cl. 112—275** **3 Claims**




**1.** In an electronically controlled sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches; means for storing pattern stitch information in an ordered sequence corresponding to the sequence of stitches within the pattern; means for generating timing pulses in timed relation with the operation of said sewing machine; means responsive to said timing pulses for extracting said pattern stitch information from said storing means; actuating means responsive to said extracted pattern stitch information for influencing the feed and bight motions of said stitch forming instrumentalities to produce a pattern of stitches corresponding to said extracted pattern stitch informa-

tion; a motor for driving said sewing machine to produce endwise reciprocation of the sewing machine needle and feed motion for the sewing machine feed mechanism; an operator actuable controller for providing a signal corresponding to an operator desired motor speed; and motor control means responsive to said signal for controlling the operation of said motor; an arrangement cooperating with said motor control means for controlling said motor to position the sewing machine needle at a predetermined position within its range of reciprocatory movement comprising:

means responsive to the initiation of a signal from said controller for causing said motor to run at a first speed;

a timer;

means responsive to said signal initiation for actuating said timer;

means responsive to termination of said signal when the timed interval is greater than a predetermined time for stopping the motor;

means responsive to termination of said signal when the timed interval is less than said predetermined time for maintaining running of the motor at said first speed until a timing pulse is sensed and then stopping the motor; and

means responsive to the timed interval being greater than a second predetermined time in the absence of a timing pulse for stopping the motor.

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**4,479,449**

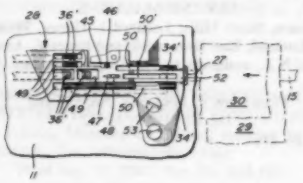
## DIFFERENTIAL FEED TYPE SEWING MACHINE

**Réjean Raiche, 628-43rd Ave., La Salle, Canada H8P 3B7**

**Filed Apr. 14, 1983, Ser. No. 484,912**

**Int. Cl.³ D05B *35/08***

**U.S. Cl. 112—312** **7 Claims**




1. A sewing machine of the differential feed type, comprising at least one sewing needle; a throat plate having a top face and a forward edge and defining one needle opening underlying said needle, a first slot in the throat plate extending in a sewing direction forwardly and laterally outward of said needle opening, a second slot in the throat plate extending in the sewing direction rearwardly of and in alignment with said needle opening, and a groove in the throat plate opening at said top face and having a bottom face, said groove extending stripwise from said forward edge towards said needle opening and in alignment with the latter in the sewing direction; gathering dogs and feeding dogs reciprocatively displaceable in the sewing direction and including a forward claw and a rearward claw, respectively, with the forward claw movable faster than the rearward claw, and both upwardly projecting through said first and second slots respectively, said groove defining a path for a band fed to said sewing needle, said forward claw being laterally outward of said path, said forward claw gripping one fabric material and moving it at a higher speed on the throat plate relative to said band and to another fabric material overlying said one fabric material, both fabric materials and said band being sewn together by said sewing needle with said one fabric material in gathered condition and both said fabric materials and said band being moved by said rearward claw.

**4,479,450**

## FLOATING DOCK

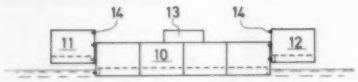
**Thorsten Lundberg, Gothenburg, Sweden, assignor to Gotaverken Arendal AB, Sweden**

**Continuation of Ser. No. 309,474, Oct. 7, 1981, abandoned. This application Sep. 1, 1983, Ser. No. 528,662**

**Claims priority, application Sweden, Oct. 13, 1980, 8007162**

**Int. Cl.³ B63C *1/06***

**U.S. Cl. 114—46** **7 Claims**




1. A floating dock of the type comprising a bottom and two parallel side walls, said dock being subdivided transversely into a middle pontoon and two end pontoons, which all are provided with individually operable ballast tanks and are removably attachable to each other, said end pontoons being dimensioned to lift said middle pontoon fully out of the water, and the latter being so dimensioned that it can lift said end pontoons fully out of the water, said middle pontoon and said end pontoons, at juxtaposed end faces of said side walls to be turned towards each other being provided with axially directed, mating male and female coupling members, integral with said side walls and located vertically so as to permit an interengagement of said juxtaposed end faces of the pontoons in two different height positions, and releasable means for receiving said pontoons in either of said different height positions, said juxtaposed end faces of said walls each including a channel formed space, said spaces, when fitted together, forming a watertight cofferdam within which said releasable means are fully accessible in a dry state.

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**4,479,451**

## SAIL WITH AIR ENVELOPE AND CONTOUR SHAPING PARTS

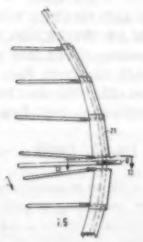
**Friedrich Lucht, Parlament, 2251 Pellworm, Fed. Rep. of Germany**

**Filed Dec. 15, 1982, Ser. No. 450,057**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149838**

**Int. Cl.³ B63H *9/04***

**U.S. Cl. 114—104** **22 Claims**



1. A sail for support on at least one of an unstayed mast and a stay comprising, a tubular air envelope portion at a front of the sail for running on said mast or said stay, a plurality of telescoping contour sleeves disposed in said tubular portion for disposition around said mast or said stay when said tubular portion is run on said mast or said stay, each of said contour sleeves having a perforated baseplate, a flexible tension member passing through one of said perforations in each said baseplate and having means for connection to each of said baseplates to hold said sleeves in a predetermined telescopically extended position on said mast or said stay when said sail is run

on said mast or said stay, and a sail mouth opening in said tubular portion.

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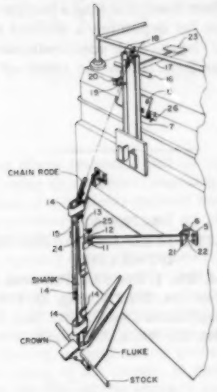
**4,479,452**

## ANCHOR HANDLING AND STORAGE DEVICE

**Thomas Y. Awalt, Jr., Pensacola, Fla., assignor to Deep Seven Co., Pensacola, Fla.**

**Continuation-in-part of Ser. No. 216,063, Dec. 12, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,284**
**Int. Cl.³ B63B *21/22***
**U.S. Cl. 114—210** **9 Claims**




1. A handling and stowage device for a swivel fluke-type anchor having a shank and generally planar flukes for folding and storing the anchor generally vertically and parallel-planar to the side of a vessel having generally vertical or upwardly receding sides comprising in combination

(a) an anchor shank receiving boom having a first axis of rotation permitting the boom to assume an inclined position and a generally vertical position for receiving, holding and releasing the shank of the anchor;

(b) means for universally mounting the boom;

(c) rotatable boom support means for the boom mounting means comprising an elongated open frame;

(d) attachment means whereby the rotatable boom support means can be secured on the side of the vessel in such a manner that when the frame is in at least one position an unfolded anchor with its shank in the shank receiving boom will clear the side of the vessel;

(e) a rotatable anchor fluke-receiving, folding, holding and releasing channeling member having a second axis of rotation substantially parallel to the first axis of rotation permitting movement of the channeling member in an arc generally from the side of the vessel to a position whereby while the shank of the anchor is along the boom in an inclined position the flukes of the anchor being held in juxtaposition with (e) by (a) can be received from their natural position with tips extending away from the shank into the channeling member, folded toward a position generally coplanar with the shank by first control forces exerted through said channeling member against a distal portion of said flukes in a direction generally towards the shank, and while applying the forces by moving around said second axis of rotation, drawing both shank and flukes generally parallel planar and in close proximity to the side of the vessel, said flukes being held in said coplanar position and released from said coplanar position by application of second control forces opposite to said first control forces;

(f) mounting means for the rotatable channeling member; and

(g) control force receiving and transfer means for the channeling member whereby external rotational force may be applied to the channeling member and transmitted through the channeling member to the anchor flukes.

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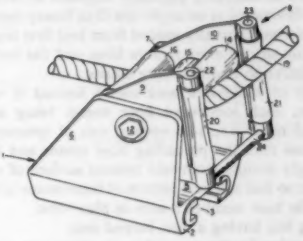
**4,479,453**

## ROLLER FAIR-SHEET FOR BOAT SAILS MANENVERING

**Luciano Bonassi, Via Filippo Reina 33, 21047 Saronno (Varese), Italy**

**Filed Sep. 29, 1982, Ser. No. 427,267**
**Claims priority, application Italy, Oct. 15, 1981, 24502 A/81**
**Int. Cl.³ B63B *21/04***
**U.S. Cl. 114—218** **6 Claims**



1. Roller fair-sheet for boat sails maneuvering, characterized by a mounting which, in one piece, forms a sliding block suitable for running on a rail and a stirrup whose two arms are constituted of two plane, vertical walls upwardly directed; a mobile frame, articulated by means of a pin to said mounting, also having two plane vertical sides which are fastened internally to said stirrup arms; at least three transversal rollers which can rotate around pins placed between said walls and arranged in such a way as to offer to a passing sheet a small curvature support arc, so that the sheet, which comes generally downward with a certain slant, entering a first one of said rollers, causes a rotation of the mobile frame around said articulation pin, thus permitting the sheet itself to lay in any case on all the transversal rollers in order to get a more uniform distribution of the stresses developed by said sheet.

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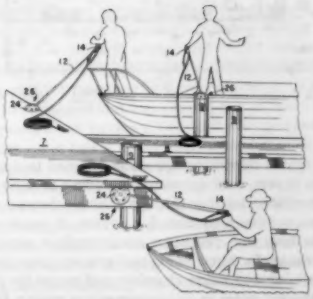
**4,479,454**

## MULTI-POSITION MOORING LINE APPARATUS

**Donald D. Schepel, 2503 Lakepoint La., Clearwater, Fla. 33520**

**Filed Jun. 13, 1983, Ser. No. 503,820**
**Int. Cl.³ B63B *21/54, 21/04***
**U.S. Cl. 114—230** **3 Claims**



1. A device of the type designed to releasably hold a moor-

ing line so that said line can be readily grasped by a boatsman as a boat approaches its docking location, comprising,

an elongate flexible rod member having a proximal end and a distal end,

a hemispherical base member having a vertical axis of symmetry,

said base member having a convex upper surface,

said base member having a flat, circular bottom surface, a plurality of bore means formed in said base member, each of said bore means adpated to slidingly receive the proximal end of said rod member,

a first bore means formed in said base member substantially orthogonal to said vertical axis of symmetry and disposed in proximity to said flat bottom surface,

a second bore means formed in said base member, said second bore means being angularly disposed to said vertical axis of symmetry at an angle less than ninety degrees and being circumferentially spaced from said first bore means and being spaced more remote from said flat bottom surface relative to said first bore means,

a plurality of successive bore means formed in said base member, each successive bore means being angularly disposed relative to said vertical axis of symmetry at an angle less than the preceding bore means and being increasingly remote from said bottom surface of said base member so that a helical pattern of bore means is observed when the base member is seen in plan view,

a mooring line having a free, looped end,

a cleat member fixedly secured to the distal free end of said rod member, and

said cleat member adapted to releasably grasp the free, looped end of said mooring line.

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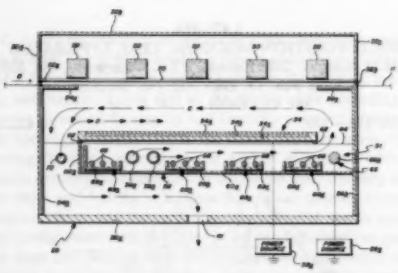
**4,479,455**

## PROCESS GAS INTRODUCTION AND CHANNELING SYSTEM TO PRODUCE A PROFILED SEMICONDUCTOR LAYER

**Joachim Doehler, Union Lake; Kevin R. Hoffman, Sterling Heights; Timothy D. Laarman, Almont; Gary M. DiDio, Drayton Plains, and Therese McDonough, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed Mar. 14, 1983, Ser. No. 475,289**
**Int. Cl.³ C23C** *13/10*
**U.S. Cl. 118—718** **10 Claims**



1. In vacuum deposition apparatus adapted to deposit semiconductor layers, said apparatus including at least one dedicated deposition chamber through which substrate material is adapted to continuously travel; a source of process gases including at least one precursor noncrystalline semiconductor material; means for introducing said process gases into each of said at least one deposition chamber; and means for decomposing the process gases in a decomposition region formed between said substrate material and said decomposing means, whereby a noncrystalline semiconductor layer is continuously deposited onto said substrate material; the improvement comprising, in combination;

channeling means for directing the process gases introduced into each of the at least one deposition chamber to pass through the decomposition region thereof in a direction substantially parallel to the direction of travel of the substrate material;

a source of precursor profiling gas; and

means for introducing said dopant profiling gas into the decomposition region of the deposition chamber in a direction of flow opposite the direction of flow of the process gases therethrough, whereby the profiling gas is adapted to diffuse through at least a portion of the decomposition region for depositing a profiled noncrystalline semiconductor layer, said semiconductor layer being substantially uniform across the width of the substrate material.

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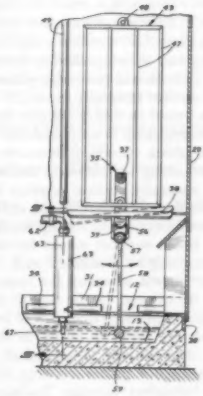
**4,479,456**

## ANIMAL ACTUATED FEED AND WATER DISPENSING APPARATUS

**Lonny D. Schweiger, Rte. 1, Box 93A, Fairmont, Minn. 56031**

**Continuation of Ser. No. 298,274, Aug. 31, 1981, Pat. No. 4,377,130. This application Dec. 9, 1982, Ser. No. 448,355**
**Int. Cl.³ A01K** *5/00, 7/06*
**U.S. Cl. 119—51.5** **13 Claims**



1. Animal feeding apparatus comprising, in combination;

a horizontal bunk, for receiving feed and water, disposed on a level surface for access by stock to be fed;

hopper means, including a generally sidewise opening, elongated feed conveying slot adjacent the bottom, and being disposed over said bunk so that feed, passing through said slot, is distributed into said bunk;

feed dispensing means, disposed in the slot in said hopper means, including elongated feed agitating and dispensing portions moveable through said feed conveying slot between positions inside and outside of said feed conveying slot and said hopper means;

actuating means operably connected to said feed dispensing means and including an operator arm extending downwardly into said bunk for operative engagement by the head of an animal; and

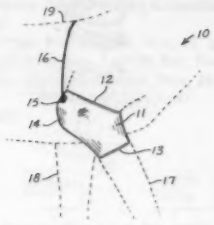
liquid dispensing means disposed on said hopper means adjacent said feed dispensing means

4,479,457

## PROTECTIVE ELBOW PAD FOR DOGS AND METHOD

Frank J. Rotolo, 619 N. Erin Blvd., Tucson, Ariz. 85711

Filed Oct. 22, 1982, Ser. No. 435,985
Int. Cl.³ A01K 29/00; A61F 13/00
U.S. Cl. 119—143 11 Claims




1. A canine elbow protector pad for covering a calloused elbow of a foreleg of a canine comprising,

a closed loop of soft pliable material having an upper opening and a lower opening, and an elbow accomodating enlargement in one side adjacent the upper opening,

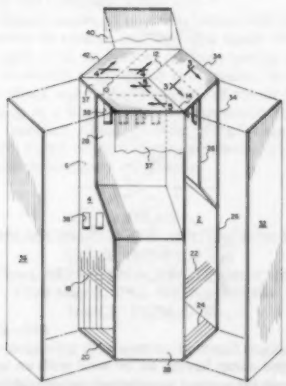
said lower opening being of a size less than the elbow so that the pad cannot pass upwardly above the elbow, and said upper opening being of a size to loosely encircle the portion of a canine foreleg above the elbow, and a length of elastic material, one end of which is attached adjacent said upper opening of said elbow protector pad, extending over the back of the canine, to hold said pad in place adjacent the elbow, the opposite end of said length of elastic material being fastened to the side of the canine opposite said foreleg.

4,479,458

## HEXAGONAL PRESSURIZED FLUIDIZED BED REACTOR

Stephen J. Goidich, Palmerton, Pa.; Archibald Robertson, Whitehouse Station, and Walter Wolowodiuk, Chatham Township, Morris County, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 3, 1983, Ser. No. 538,596
Int. Cl.³ F22B 1/02
U.S. Cl. 122—4 D 18 Claims



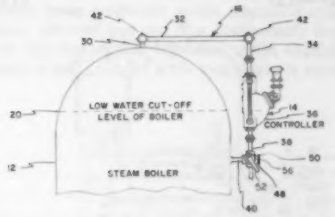
1. A reactor comprising a cylindrical vessel, plurality of vertical panels disposed in said vessel and constructed and arranged so as to form three combustion cells, with three of said panels forming common walls between adjacent cells, at least a portion of said panels being formed by water tubes, and means for selectively heating said cells to convert the water flowing through said tubes to steam, a portion of the tubes of one of the panels forming each cell extending in a horizontal position to form an air distribution grid.

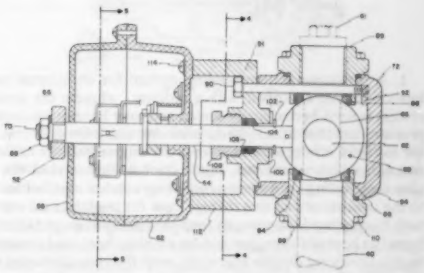
4,479,459

## SEQUENCING BLOW DOWN VALVE MECHANISM

Jack R. Piper, Mount Prospect, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,685
Int. Cl.³ F22B 37/48; F28G 9/00; F16K 31/04
U.S. Cl. 122—379 8 Claims



1. A blow down apparatus for a commercial steam boiler equipped with an equalizing network comprising a steam pipe from the boiler to the network, a network intermediate line, a network return line from the network to the boiler, and a blow down line from a junction between the network intermediate line and the network return line, the invention comprising a unitary sequencing valve at said junction, means for sequencing said valve from a normal operative position enabling communication between said network line and said return line disabling flow from the network to the blow down line, to respective blow down positions placing said blow down line in open communication with the respective network lines in a sequence, said valve comprising a member having a passage therein, and in which said sequencing means comprises means for rotating positioning said valve member to said respective positions, and for returning said valve member to the normal position to terminate said sequence in which said valve member comprises a ball having a T-shaped passage therein, and in which said valve ball is affixed to a rotatable shaft normal to said passages, and in which there is means for rotating said shaft and limiting said motion to unidirectional respective 90° rotative cycles to position the passages of said ball in communication with respective combinations of said lines at the respective positions, means for limiting the rotation of said shaft to one direction and for stopping the rotation of said ball at said positions, and an enclosing housing for said valve, said housing having O rings circumscribing opposite ones of said lines, said rings bearing against said ball to journal said ball for rotation, said rings being cooperative with said ball and said housing for

sealing said lines and said ball passages against inadvertant flow therefrom.

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**4,479,460**

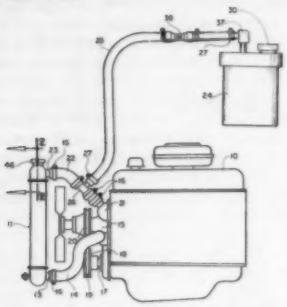
## PRESSURE-VACUUM COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINE UTILIZING RESERVOIR

**Robert C. Webber, 908 Holoma Dr., Indian River Shores, Fla. 32960**

**Continuation-in-part of Ser. No. 256,944, Apr. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 304,832, Sep. 23, 1981, Pat. No. 4,414,926. This application Nov. 22, 1982, Ser. No. 443,601**

**Int. Cl.³ F01P *11/18***

**U.S. Cl. 123—41.27** **11 Claims**



**1**. A pressure-vacuum cooling system for an internal combustion engine equipped with a radiator, wherein the cooling system is semi-hermetically sealed and may have on occasion a pressure less than atmospheric pressure, and wherein a connector for fluid is interposed between the engine and the radiator, through which connector, liquid coolant flows when the engine is operating, said system including conduit means attached to the connector and to a storage tank for coolant, said storage tank having insulation means such that its contents are shielded from the heat of the engine and/or ambient heat, said insulation means involving double sidewalls, with the space between said sidewalls evacuated, conduit means forming a path for coolant to flow on occasion between the radiator and engine on the one hand, and said storage tank on the other, a removable cap which, when removed, enables additional liquid, when needed, to be added to said cooling system, said cap having therein a one way valve set to open in the pressure range of between 10 and 20 pounds per square inch when the engine is operating and the coolant has been heated thereby, said cap when in place, effectively preventing the admission of any atmospheric air to the cooling system after the engine has thereafter ceased operation and the liquid coolant has cooled, such that a pressure below ambient may be maintained in the system.

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**4,479,461**

## COIL SPRING DAMPER FOR VALVE ASSEMBLIES OF INTERNAL COMBUSTION ENGINES

**Mario J. Felice, Dearborn Heights, and Walter T. Mayers, West Bloomfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich., by said Mario J. Felice**

**Filed Jul. 15, 1982, Ser. No. 398,501**

**Int. Cl.³ F01L *1/00***

**U.S. Cl. 123—90.65** **16 Claims**

**10**. A valve assembly for an internal combustion engine, said valve assembly characterized by:

a valve member including;

a valve head seated about a port through a housing;

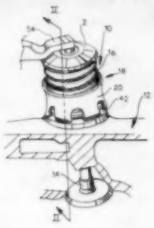
a valve stem extending from said head; and

a coil spring seat axially fixed to said valve stem;

a coil spring comprising helical coils interposed between said housing and said coil spring seat about said stem to bias said valve member to a first position;

means for moving said valve member to a second position against the bias of said coil spring;

a sleeve member having a longitudinal slot therethrough and constructed to be biased to a first radial position and resiliently movable to a second radially larger position; and



said sleeve member, when in said second radially larger position, being sized to receive a plurality of coils of said coil spring and biased to said first position of frictionally abut the radially outer portion of said coils, a remaining plurality of said coils not being engaged by said sleeve when said coil spring is in said first position, such that, when said engaged coils axially move, said sleeve frictionally slides against said coils to damp the motion of said spring.

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**4,479,462**

**Patent Not Issued For This Number**

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**4,479,463**

## ENGINE SUMP

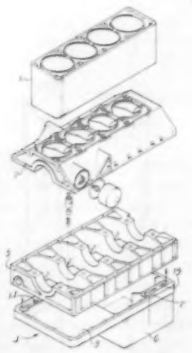
**Laurence D. Curley, Huntingdon; David A. Whitehead, Stamford, and Rodney A. Bedborough, Westwood, all of England, assignors to Perkins Engine Group Limited, London, England**

**Filed Feb. 17, 1983, Ser. No. 467,420**

**Claims priority, application United Kingdom, Feb. 25, 1982, 8205586**

**Int. Cl.³ F01M *1/12***

**U.S. Cl. 123—195 C** **9 Claims**

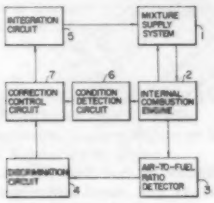


**1**. An engine sump having an oil well with an upright side wall having an oil suction passage completely integrally cast thereon so as to extend vertically between a lower opening of the passage that communicates with the sump at its lower end adjacent the side wall and an upper opening of the passage facing towards a crankcase at a top end of the sump adjacent the side wall, thereby to communicate with a passage in said crankcase leading to an oil pump.

## 4,479,464
## AIR-TO-FUEL RATIO CORRECTING ARRANGEMENT IN A FUEL SUPPLY CONTROL SYSTEM HAVING A FEEDBACK LOOP

**Toshio Kondo, Anjo; Hideaki Norimatsu; Mitsuo Nakamura, both of Kariya; Akira Masuda, Aichi, and Sigenori Kitazima, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Continuation of Ser. No. 742,914, Nov. 17, 1976, abandoned. This application Sep. 7, 1978, Ser. No. 940,388**
**Claims priority, application Japan, Nov. 24, 1975, 50-140948**
**Int. Cl.³ F02B** *33/00*
**U.S. Cl. 123—489** **9 Claims**




1. An air-to-fuel ratio feedback control system for internal combustion engines comprising:

an air-to-fuel ratio detector positioned in an exhaust pipe of an internal combustion engine and responsive to an exhaust gas component to provide a detection signal indicative of the air-to-fuel ratio of an air-fuel mixture supplied to said engine;

feedback means including a capacitor for performing an integrating operation, said feedback means producing a feedback signal changing in response to change in said detection signal;

condition detector means, coupled to said engine, for generating a condition signal when said engine is in accelerating and decelerating conditions;

correction control means electrically connected between said ratio detector and said feedback means and responsive to said condition signal for interrupting the connection between the detector and said feedback means thereby causing to be maintained on said capacitor a feedback signal having a value occurring just before the generation of said condition signal; and

mixture supply means, continously connected to said feedback means to receive said feedback signal, for supplying said engine with an air-fuel mixture having a pre-established air-to-fuel ratio which is corrected in response to said feedback signal, the correction of the air-to-fuel ratio remaining at a constant value determined by the maintained feedback signal, irrespective of changes in said detection signal, while said engine remains in said accelerating and decelerating conditions.

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## 4,479,465
## FUEL-MEASURING FLOW SYSTEM FOR DIESEL ENGINES

**Robert E. Flynn, 953 No. Greer Ave., Covina, Calif. 91724**

**Filed May 2, 1983, Ser. No. 490,456**
**Int. Cl.³ F02M** *37/00*
**U.S. Cl. 123—514** **5 Claims**

1. A fuel-measuring flow system for diesel engines, comprising:

a fuel tank for storing fuel therein having a fuel outlet and an inlet vent, said fuel outlet being interconnected to said engine by a fuel line;

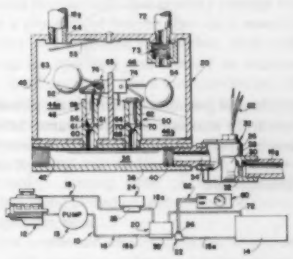
a fuel-injector-pump means mounted in said fuel line to pump fuel from said fuel tank when said engine is running;

a relay-valve means mounted in said fuel line and interposed between said tank and said pump means, said relay-valve means including a discharge orifice, an inlet, and a controlled outlet vent, said outlet vent being connected to said tank;

said relay-valve means defining a chamber interposed between said inlet and said discharge orifice to receive unburned fuel therein as said engine is running; and

said relay-valve means including a first float-valve means adapted to control a first discharge orifice, and a second float-valve means adapted to control a second discharge orifice;

said first and second float-valve means being mounted to a central baffle wall which defines a first chamber section and a second chamber section, and each of said float-valve means being positioned within respective chamber sections, whereby fuel can flow continuously from at least one chamber section, regardless of the angular displacement of said chamber while said engine is running;



a flow-metering means defined by a transducer having a flow-restrictive orifice to establish a given amount of continuous flow therethrough, said flow-metering means including a meter-recording means to record all fuel as it leaves said tank;

a manifold having a mixing chamber wherein said transducer is connected upstream thereof, whereby fuel passes from said flow-restrictive orifice into said mixing chamber under vacuum, and wherein said discharge orifice of said relay valve is arranged to communicate with said mixing chamber downstream of said flow-restrictive orifice; and

a fuel-return line adapted to be connected to said pump means and said relay-valve means for feeding unburned fuel in a controlled manner into said manifold downstream of said transducer whereby only fuel from said tank is metered.

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## 4,479,466
## NATURAL GAS AND AIR MIXING DEVICE

**Donald O. Greenway, and Frank J. Davis, both of 6275 Georgia Hwy. 85, Riverdale, Ga. 30274**

**Filed Nov. 22, 1983, Ser. No. 554,362**
**Int. Cl.³ F02M** *21/04*
**U.S. Cl. 123—527** **35 Claims**

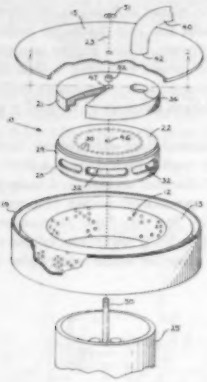
1. A natural gas and air mixing device for allowing the introduction of a combustible mixture of natural gas and air into a conventional internal combustion engine carburetor, comprising:

rim means for positioning over substantially the entire air intake of a conventional internal combustion engine carburetor and defining an interior volume of mixing the gas and air,

said rim means including a plurality of air passageways for introducing air from a conventional air cleaner into said interior volume;

an upper plate member rigidly secured to said rim means and including a plurality of gas-dispersing apertures positioned over said interior volume; and

hollow gas plenum means positioned on said plate member above said gas-dispersing apertures for receiving a supply of natural gas;



whereby natural gas introduced into said plenum is dispersed downwardly into said interior volume through said gas-dispersing apertures and mixes with air entering said interior volume through said air passageways to form a combustible mixture.

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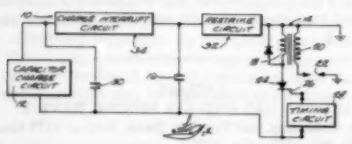
**4,479,467**

## MULTIPLE SPARK CD IGNITION SYSTEM

**Thomas W. Burrows, West Allis, and David T. Cavil, Menominee Falls, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Dec. 20, 1982, Ser. No. 450,902**
**Int. Cl.³ F02P *3/08***
**U.S. Cl. 123—606** **32 Claims**



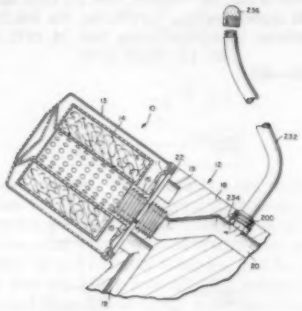

1. A multiple spark circuit adapted for use with a CD ignition system adapted for connection to a capacitor charge circuit and including a charge capacitor, an ignition coil including a primary winding, and an ignition timing circuit including a timing switch for allowing selective discharge of the charge capacitor through the primary winding to produce an ignition spark, said multiple spark circuit comprising a charge reservoir capacitor adapted for connection to the capacitor charge circuit, restrike circuit means, subject to the timing switch, and to the voltage and discharge current of the charge capacitor, for allowing repeated charging and discharging of the charge capacitor to produce multiple ignition sparks at each ignition timing point, and charge interrupt circuit means, subject to said restrike circuit means, for allowing repeated charging of the charge capacitor by said charge reservoir capacitor at each ignition timing point.

**4,479,468**

## AUTOMOTIVE OIL FILTER PRECHARGING ARRANGEMENT

**Joseph E. Norwood, Sr., 312 Keyser Ave., Petersburg, W. Va. 26847**

**Division of Ser. No. 400,753, Jul. 22, 1982, Pat. No. 4,433,656.**
**This application Dec. 9, 1983, Ser. No. 559,880**
**Int. Cl.³ F01M *1/00***
**U.S. Cl. 123—196 S** **2 Claims**



1. In an internal combustion engine having a lubrication system including oil passages in the engine block, and filter mounting means on the block for an oil filter in the flow of the oil, the improvement of an oil precharging means for said filter comprising:

an externally accessible port in said engine block located proximate to said filter mounting means and in fluid communication with an oil passage leads to said filter through said mounting means, said port allowing manual introduction of oil into an empty, newly installed filter, before said engine is started, to minimize wear of said engine; and

closure means for closing said port after the filter has been charged with oil.

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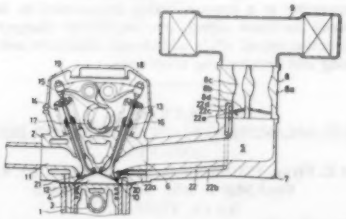
**4,479,469**

## INTERNAL COMBUSTION ENGINE

**Yuzuru Namba; Kenichi Aoyagi, and Hiroshi Yokoyama, all of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan**

**Filed Sep. 8, 1981, Ser. No. 300,112**
**Claims priority, application Japan, Sep. 29, 1980, 55-135608; Nov. 8, 1980, 55-157320**
**Int. Cl.³ F02M *35/10***
**U.S. Cl. 123—308** **7 Claims**



1. An internal combustion engine comprising:

A. a combustion chamber defined by a cylinder, a piston, and a cylinder head; and

B. a carburetor constituting means for mixing fuel with air and supplying the resultant air-fuel mixture to the combustion chamber via a main suction path; said carburetor

having a main barrel comprising a venturi and a main barrel throttle valve and a secondary barrel comprising a secondary venturi and a secondary throttle valve; and

C. a sub-suction path provided separately from said main suction path for injecting a gas into the combustion chamber during the suction stroke of the piston thereby to generate a swirl in the suction gases in the combustion chamber thereby improving their rate of combustion; wherein the outlet end of the sub-suction path is into the main suction path at a point directly upstream of the suction valve;

wherein the amount of air supplied to said combustion chamber via said sub-suction path is from 10 to 40% of the total amount of air supplied to said combustion chamber;

wherein the area of the sub-suction path at its open end is 0.2 to 3.0% of the area of the main suction path;

wherein the internal diameter of the outlet end of said sub-suction path is 1.5 to 2.5 mm.

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**4,479,470**

## INTAKE PASSAGE STRUCTURE FOR INTERNAL COMBUSTION ENGINES

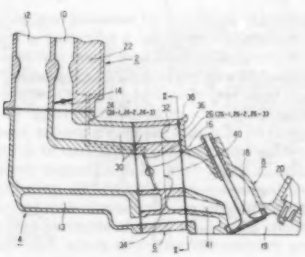
**Tokuzi Ishida, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Kami, Japan**

**Filed Jul. 28, 1982, Ser. No. 402,693**

**Claims priority, application Japan, Aug. 11, 1981, 56-124653**

**Int. Cl.³ F02M** *35/10, 13/04*

**U.S. Cl. 123—308** **3 Claims**



1. An intake passage structure for an internal combustion engine, comprising:

a two-barrel carburetor having a float chamber;

a cylinder head having combustion chambers therein;

an intake manifold coupled with said two-barreled carburetor;

a block interposed between said intake manifold and said cylinder head, said block having a first surface thereon which is positioned in opposed abutting engagement with a second surface on said cylinder head;

primary air-fuel mixture passage means extending from said carburetor through said intake manifold, said block and said cylinder head for supplying an air-fuel mixture to said combustion chambers when said internal combustion engine operates in a full range of loads including relatively low loads, said primary passage means including a common primary passage extending from said carburetor through said intake manifold and thence through said block, said common primary passage having the downstream end thereof terminating at said first surface of said block;

said primary passage means having a movable primary throttle valve disposed in said carburetor in association with said common primary passage;

secondary air-fuel mixture passage means extending from said carburetor through said intake manifold, said block and said cylinder head for supplying an air-fuel mixture to said combustion chambers when the internal combustion engine operates under relatively high loads, said secondary passage means having a secondary passage which extends from said intake manifold through said block and thence through said cylinder head for communication with each respective said combustion chamber, said secondary passage having a movable secondary throttle valve associated therewith and disposed in said block;

said primary passage means including a plurality of intake port passages which are formed in said cylinder head and have upstream ends thereof opening through said second surface, each intake port passage having a downstream end which communicates with a respective said combustion chamber;

said primary passage means including an elongated distribution slot which is formed in said block and communicates with said common primary passage at the downstream end thereof, said distribution slot as formed in said block extending transversely relative to said common primary passage and being formed in said block directly at said first surface so that one side of said distribution slot opens through said first surface, said primary passage means also including a plurality of branch slots each associated with a respective said combustion chamber, each said branch slot having an upstream end thereof in communication with the distribution slot and a downstream end thereof in communication with the upstream end of a respective said intake port passage, said branch slots being formed in said block directly at said first surface so that one side of said branch slots opens outwardly through said first surface, the outwardly opening sides of said distribution and branch slots being closed by said second surface as formed on said cylinder head;

a water jacket positioned adjacent one side of said secondary passage, said common primary passage being located substantially adjacent the diametrically opposite side of said secondary passage from said water jacket so as to be remotely located from said water jacket;

each said branch slot extending transversely with respect to, but in close proximity to, the secondary passage associated with the respective combustion chamber; and

a secondary slow fuel supply passage extending from said float chamber adjacent to said common primary passage and terminating in a secondary slow fuel supply port opening into said secondary passage in the vicinity of said secondary throttle for supplying fuel into the secondary passage when the air-fuel mixture is supplied through the secondary passage to the combustion chamber.

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**4,479,471**

## METHOD FOR CONTROLLING ENGINE IDLING RPM IMMEDIATELY AFTER THE START OF THE ENGINE

**Shumpei Hasegawa, Niiza; Noriyuki Kishi, Itabashi, and Takashi Koumura, Iruma, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan**

**Filed May 3, 1983, Ser. No. 491,208**

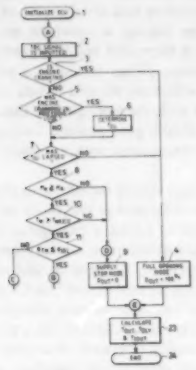
**Claims priority, application Japan, May 8, 1982, 57-77250**

**Int. Cl.³ F02D** *9/02, 31/00*

**U.S. Cl. 123—339** **5 Claims**

1. A method for controlling a control valve for regulating the quantity of supplementary air being supplied to an internal combustion engine, in a feedback manner responsive to the difference between actual engine rpm and desired idling rpm during idling of the engine, the method comprising the steps of: (a) detecting engine rpm at the start of the engine; and (b) opening said control valve to a maximum opening for a prede-

termined period of time from the time the engine rpm is detected to have increased above a predetermined value lower



than said desired idling rpm, whereby the engine rpm is maintained at a value higher than said desired idling rpm.

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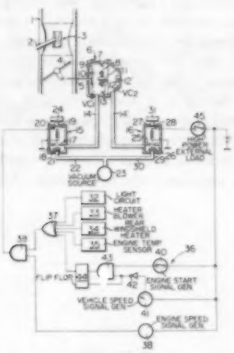
**4,479,472**

## APPARATUS AND METHOD FOR CORRECTING THE THROTTLE OPENING FOR AUTOMOTIVE ENGINES PARTICULARLY AFTER STARTING OF THE ENGINES

**Haruo Shimamura, Kawashima, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 1, 1982, Ser. No. 344,723**
**Claims priority, application Japan, Feb. 10, 1981, 56-18556**
**Int. Cl.³ F02D 11/06**
**U.S. Cl. 123—340** **14 Claims**



1. A throttle-opening correcting apparatus for an automotive engine of a vehicle in which the engine has a throttle valve movable between closed and open positions for controlling engine speed, said apparatus comprising actuator means connected to the throttle valve of the engine for opening the throttle valve in increasing direction to a first corrected state; power means connected to said actuator means for feeding operational power thereto; first detecting means for detecting the state of the started engine and thereupon operative to render said power means operative; second detecting means for detecting a predetermined running state of the vehicle for rendering said power means inoperative, third detecting means for detecting a predetermined engine speed, and means connecting said first, second and third detecting means so that with the predetermined running state of the vehicle not achieved, the power means remains operative and the throttle valve is kept in its first corrected state provided said third detecting means detects engine speed below said predetermined engine speed and when said third means detects engine speed above said predetermined engine speed said power means is rendered inoperative irrespective of the detected running state of the vehicle.

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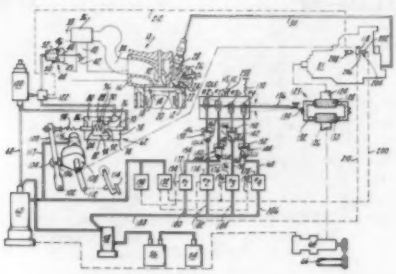
**4,479,473**

## DIESEL ENGINE EMISSION CONTROL SYSTEM

**Wallace R. Wade, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**PCT No. PCT/US83/00028, § 371 Date Jan. 10, 1983, § 102(e) Date Jan. 10, 1983, PCT Pub. No. WO84/02746, PCT Pub. Date Jul. 19, 1984**
**PCT Filed Jan. 10, 1983, Ser. No. 465,857**
**Int. Cl.³ F02P 5/04**
**U.S. Cl. 123—341** **20 Claims**



1. A mechanical-vacuum system for a diesel engine having an intake manifold, an exhaust manifold for the flow of exhaust gases therethrough, a fuel injection pump operably connected to a vehicle accelerator pedal, the system controlling emissions from the diesel engine by controlling the recirculation of engine exhaust gases into the intake manifold and by modulating the injection timing schedule of the engine fuel injection pump, the system including

an exhaust gas recirculation (EGR) system including a spring closed vacuum controlled EGR valve in a passage connecting the engine exhaust and intake manifolds,

an EGR valve servo connected to the EGR valve for moving open the EGR valve,

an engine driven fuel injection pump providing a fuel output that varies in proportion to engine speed and load,

the pump having movable means for varying the fuel injection timing and a movable fuel flow control lever connected to the vehicle accelerator pedal for controlling the pump fuel delivery as a function of accelerator pedal position,

a source of vacuum connected to the EGR valve servo to operate the same,

vacuum control means to control the flow of vacuum to the EGR valve servo in response to changes in fuel pump flow and engine load and speed,

and means responsive to engine speed and load connected to the pump movable means for modulating the pump injection timing concurrent with control of the EGR flow to control the engine emission output.

4,479,474

## RPM GOVERNOR FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES, IN PARTICULAR A FINAL IDLING RPM GOVERNOR OF AN INJECTION PUMP FOR DIESEL VEHICLE ENGINES

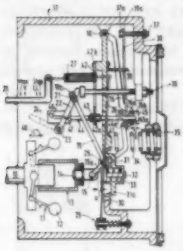
Ilija Djordjevic; Werner Brühmann; Ernst Ritter, and Hansjörg Frey, all of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,501

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131131

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—373 12 Claims



1. A housed rpm governor for fuel-injected internal combustion engines, in particular a minimum-maximum speed governor of an injection pump for Diesel vehicle engines, having a governor lever coupled with a supply quantity adjusting member of said injection pump, said governor lever being actuatable both by a governor sleeve in accordance with rpm and further by an adjusting member which is pivotable for arbitrary variation of said supply quantity, said governor further having a force transmission lever arranged to rest on a stop means attached to said housing, said last named lever further being subjected to the initial stressing force of a primary governor spring and pivotable about a rotary axis attached to said housing and with which said governor member arrives at an operational state following the traversing of an idling path (a) of said governor sleeve effected counter to the force of at least two idling springs, the restoring force of said first idling spring being reinforced on one portion of said idling sleeve path (a) by means of a restoring force of said second idling spring, and wherein the exertion of force of at least one of said two idling springs is variable in accordance with the pivoted position of said adjusting member, characterized in that upon said adjusting member being pivoted out of the idling position into a partial-load position, the exertion of force of at least one of said two idling springs is increasable by means of a corrective adjusting member actuatable by said adjusting member in a sense to achieve a supply quantity which is progressively increased upon increasing load and a partial-load rpm which is regulated and increased with respect to said idling rpm.

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4,479,475

## PRESSURIZED FUEL INJECTION SYSTEM FOR MULTI-CYLINDER ENGINES, PARTICULARLY DIESEL ENGINES

Rudolf Babitzka, Kirschberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,091

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148671

Int. Cl.³ F02M *41/02, 39/00*

U.S. Cl. 123—446 9 Claims

1. Pressurized fuel injection system for a multi-cylinder internal combustion engine, particularly multi-cylinder diesel engine fuel injection system having

a plurality of injection valves (11–14) each injection valve having a valve piston (7–10) operable in a respective valve cylinder (24–27);

timed mechanical drive means (2–5) coupled (15–23) to a crank shaft (6) of the engine, and to the valve pistons for reciprocating the valve pistons;

a fuel supply system (33–37) providing fuel from a tank (36);

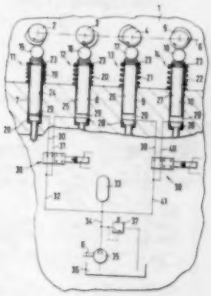
a connection line (30, 31; 33, 40; 32, 41) from the fuel supply system to the injection valves;

and an electrically controlled control valve (38, 42) hydraulically connected into the connection lines between the fuel supply system and the injection valves,

wherein, in accordance with the invention

the control valve (38, 42) comprises

a spool valve having a valve spool (45) moveable between first and second positions, respectively placing the connection lines (30, 31; 39, 40) of at least two injection valves (11, 12; 13, 14) either in open, hydraulically communicating, or closed, hydraulically blocking state;



electrically controlled positioning control means (59, 63) moving said valve spool between the respective first and second positions;

and wherein the mechanical drive means (2–5) are so coupled to the valve pistons of the at least two injection valves (11, 12; 13, 41) and are, respectively, so timed that during an injection pulse, only one of the valve pistons (7 or 8; 9 or 10) of the at least two injection valves (11, 12; 13, 14) is moved to provide for fuel injection therefrom,

the electrically controlled piston control means (59, 63) controlling, respectively, blocking, and unblocking of hydraulic communication between the fuel supply system and the at least two valves, controlled by the electrically controlled positioning control means of the connecting lines to unblocked, or hydraulically communicating state permitting overflow of fuel from the respective valve through the respective communicating lines even during occurance of operation of the mechanical drive means to move the respective piston in a direction to expel fuel from the respective cylinder of the respective valve.

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4,479,476

## METHOD AND APPARATUS FOR OPTIMUM CONTROL OF INTERNAL COMBUSTION ENGINES

Atsushi Suzuki, and Masakazu Ninomiya, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 20, 1982, Ser. No. 341,171

Claims priority, application Japan, Jan. 26, 1981, 56-9835

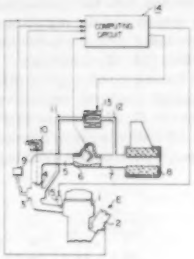
Int. Cl.³ F02M *51/00*

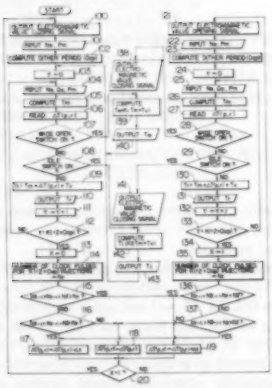
U.S. Cl. 123—478 11 Claims

2. A method for optimum control of an internal combustion engine comprising the steps of changing an air-fuel ratio alternately to richer and leaner directions with respect to a basic air-fuel ratio by a dither quantity during a dither period, operating said engine by supplying said engine with a mixture of the changed air-fuel ratio, detecting a resultant change in an output

of said engine, deciding the direction of a change of the air-fuel ratio toward an optimum air-fuel ratio on the basis of the result of said detection, and modifying the basic air-fuel ratio in the direction of said change toward an optimum air-fuel ratio on the basis of the result of said decision, thereby optimizing fuel consumption of said engine;

wherein said optimum control method further comprises the steps of detecting an operating state of said engine and





producing signals associated with the operating state of said engine, and changing at least one of said dither period and dither quantity in accordance with said signals, and wherein the changing of the air-fuel ratio is effected by dithering an air supply quantity to said engine, and the modifying of the basic air-fuel ratio is effected by modifying a basic fuel supply quantity to said engine in the direction of improving the output of said engine in accordance with said signals.

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**4,479,477**

## DIESEL FUEL HEATER AND COMBINED FILTER-HEATER ASSEMBLY

**Stephen T. Manchester, Limerick, Me., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Apr. 29, 1983, Ser. No. 490,069**
**Int. Cl.³ F02M *31/00***
**U.S. Cl. 123—557** **26 Claims**

1. A diesel fuel heater for use with a fuel filter housing having a fuel inlet and a fuel outlet therein and a fuel filter element adapted for being normally secured to said fuel filter housing, said heater comprising:

an electrically insulative housing having a fuel inlet therein;

an electrically conductive mounting plate securedly positioned within a lower part of said insulative housing and having a fuel outlet therein, said mounting plate and said insulative housing defining a fuel passage within said insulative housing extending from said fuel inlet to said fuel outlet;

a plurality of positive temperature coefficient thermistors spacedly positioned on said conductive mounting plate for contacting said diesel fuel passing through said fuel passage and for heating said fuel to an established temperature;

means for coupling electrical power to each of said spacedly positioned thermistors on said mounting plate; and

adapter means positioned substantially within said insulative housing for interconnecting said fuel filter housing and said fuel filter element at a spaced apart relationship whereby said fuel heater will be positioned between said fuel filter housing and said filter element such that fuel passing from said fuel filter housing to said filter element will pass through said fuel passge and be heated by said thermistors.

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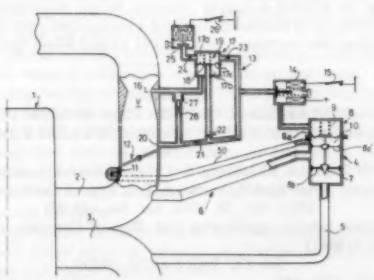
**4,479,478**

## DEVICE FOR CONTROLLING THE RECIRCULATION OF EXHAUST GASES IN INTERNAL COMBUSTION ENGINES

**Henri Arnaud, La Ferte Alais, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France**

**Filed Oct. 11, 1983, Ser. No. 540,840**
**Claims priority, application France, Oct. 11, 1982, 82 16958**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—571** **9 Claims**



1. In an internal combustion engine having an intake pipe including a venturi throat, an exhaust pipe, a recirculation circuit connected between said intake and exhaust pipes, a

main valve in said recirculation circuit and a first solenoid valve connected to said main valve, a device for controlling recirculation of exhaust gas through said recirculation circuit, said device comprising an additive type pneumatic amplifier including:

first means for sensing a partial vacuum at said venturi throat;

means for developing a pneumatic vacuum signal greater than said partial vacuum by a constant value over an extended engine operation range; and

means for delivering this signal to said first solenoid valve for controlling said main valve.

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**4,479,479**

## ELECTRONICALLY CONTROLLED IGNITION SYSTEM AND USE OF THIS IGNITION SYSTEM

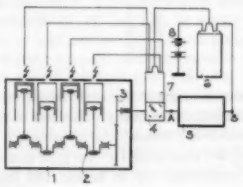
**Christoph Dömland, Wolfsburg, and Willy Minner, Schwaigern, both of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn and Volkswagenwerk AG, Wolfsburg, both of, Fed. Rep. of Germany**

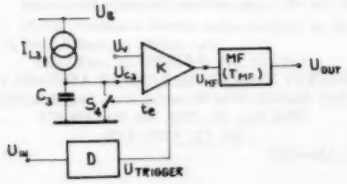
**Filed Mar. 12, 1982, Ser. No. 357,671**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111856**

**Int. Cl.³ F02P *11/00***

**U.S. Cl. 123—630** **14 Claims**






1. An electronically controlled ignition system for an internal combustion engine having a spark plug which is ignited by an ignition voltage pulse of a given magnitude comprising:

an ignition coil having primary and secondary windings, said secondary winding being connected for supplying the ignition voltage pulse to the spark plug in response to a primary current in said primary winding;

an ignition pulse generator for producing a control signal corresponding to the speed of the engine;

an electronic control means connected to said ignition pulse generator and to said ignition coil and being responsive to the control signal for controlling the time period during which current flows in said primary winding in dependence of the speed of the engine, said electronic control means producing an output signal which is used to control the time at which primary current starts to flow in said primary winding so that the primary current reaches a magnitude corresponding to the given magnitude of the ignition voltage pulse just prior to when the spark plug is ignited, said electronic control means further providing a determination of when there is insufficient current in said primary winding to prevent a mis-fire of the spark plug during a fluctuation in engine speed and upon such a determination substituting, for a fixed period, the control signal of said pulse generator for the output signal of said electronic control means so that the time at which primary current starts to flow in said primary winding is determined directly by the control signal, said electronic control means further automatically and continuously reinstituting the use of the output signal of said electronic control means to control the time at which primary current starts to flow in said primary winding at the end of the fixed period.

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**4,479,480**

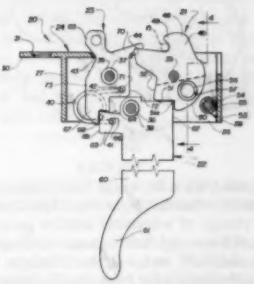
## CROSSBOW TRIGGER MECHANISM

**Zedoc A. Holt, 2125 Brookhurst Ave., Columbus, Ohio 43229**

**Filed Sep. 29, 1982, Ser. No. 428,203**

**Int. Cl.³ F41B *5/00***

**U.S. Cl. 124—35 R** **21 Claims**



1. A crossbow trigger mechanism for alternatively holding of a crossbow string in cocked position and release thereof comprising

string holding cylinder means releasably engageable with a crossbow string and pivotably supported for rotation about its pivot axis between a first position for holding a string in cocked position when engaged therewith and a second position where a string is released from such engagement, and said string holding cylinder means being adapted to be rotated in response to movement of a crossbow string after the latter is released from its cocked position

trigger lever means pivotably supported for rotation about its pivot axis between a latch position in mechanical engagement with said cylinder means for maintenance of said holding cylinder means in said first position and an unlatched position enabling said cylinder means to revolve toward said second position,

locking lever means pivotably mounted on said frame for rotation about its pivot axis between a locked position in mechanical engagement with said trigger lever means to prevent rotation of said trigger lever means out of latching engagement with said cylinder means and an unlocked position permitting rotation of said trigger lever means to said unlatch position, said locking lever means, when in said unlocked position, adapted to be engaged by said cylinder means during revolution of said cylinder means to said string releasing position and rotated by said cylinder means in a direction toward the locked position of said locking lever means, and

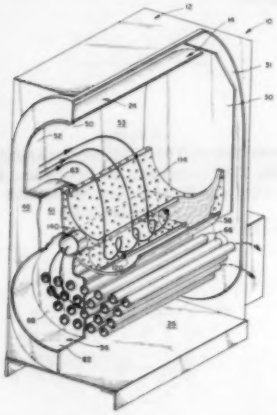
biasing means connected with said locking lever means for biasing of said locking lever means to either its locked or unlocked positions.

**4,479,481**

## WOOD FUEL HEATING APPARATUS AND COMBUSTION PROCESS

**Charles S. Ingersoll, Ridge Rd., Centerbrook, Conn. 06426, and E. Peter Schellens, South Cove Farm, Essex, Conn. 06420**

**Filed Aug. 13, 1981, Ser. No. 292,691**
**Int. Cl.³ F24B 5/00**
**U.S. Cl. 126—76** **35 Claims**



1. In a downdraft solid wood fuel heating apparatus comprising a wood firebox having a wood fuel charge chamber for receiving a charge of wood fuel and for generally downdraft combustion of the wood fuel from generally the bottom of the fuel charge chamber, and a heat exchanger having an inlet connected to the firebox for receiving the hot gaseous products of combustion therefrom and a heat exchanger outlet for exhausting the gaseous products of combustion, the improvement wherein the firebox comprises a refractory hearth structure having an outer refractory hearth surface defining in part a combustion zone at generally the bottom of the fuel charge chamber and elongated internal combustion chamber means within the hearth structure and adjacent to said outer hearth surface for prolonged high temperature combustion therein within the hearth structure adjacent to said outer hearth surface and having an outlet end connected to the heat exchanger inlet and a first elongated combustion chamber conduit extending within the refractory hearth structure generally parallel and adjacent to said outer hearth surface, the said first elongated combustion chamber conduit having a transverse width substantially less than the corresponding transverse width of the said outer refractory hearth surface and the refractory hearth structure generally surrounding the said elongated internal combustion chamber means and having a transverse sectional area substantially greater than the corresponding transverse sectional area of the said elongated internal combustion chamber means to provide for said prolonged high temperature combustion within the hearth structure, and inlet means in said outer hearth surface extending longitudinally generally parallel to said first elongated combustion chamber conduit and connecting said combustion zone to said first elongated conduit.

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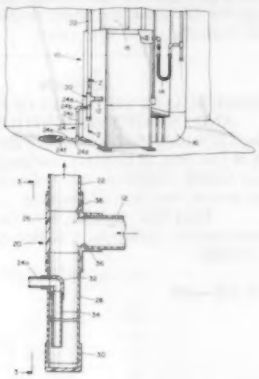
**4,479,482**

## DRAIN LEG ASSEMBLY

**Floyd E. Cherington, Carrollton, Tex., assignor to Lennox Industries, Inc., Dallas, Tex.**

**Filed Jan. 14, 1983, Ser. No. 457,901**
**Int. Cl.³ F24H 3/00**
**U.S. Cl. 126—99 R** **6 Claims**

1. In a condensing furnace for heating an environment utilizing a pulse combustion process and having flue gas conduit means for discharging flue gas and condensate from the furnace, the improvement comprising a drain leg assembly connected to the flue gas conduit means, said drain leg assembly including tubular body means having inlet means communicating with the flue gas conduit means, flue gas outlet means connected to a flue gas vent for discharging flue gas exterior of the environment, condensate outlet means connected to a drain line for discharging condensate separate from the flue gas, said



flue gas outlet means being at the same height as or above the inlet means, said condensate being collected in the lower portion of the tubular body means, said condensate outlet means being below the inlet means, and a vent pipe communicating at one end to the condensate outlet means, the free end of said vent pipe extending toward the bottom of the tubular body means, but spaced from said bottom, whereby condensate collected in the tubular body means may be discharged through the vent pipe and condensate outlet means.

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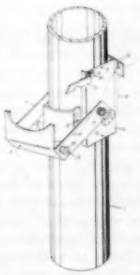
**4,479,483**

## SAFETY STOVEPIPE DAMPER ASSEMBLY

**Kenneth H. Raihala, 2316 Wyoming Ave., Superior, Wis. 54880**

**Filed Apr. 26, 1983, Ser. No. 488,653**
**Int. Cl.³ F23L 3/00**
**U.S. Cl. 126—292** **7 Claims**



1. A thermally responsive safety stovepipe damper assembly adapted for mounting in a natural draft combustion unit flue, said damper assembly comprising a generally cylindrical duct for mounting in communication with said flue, said flue having a pair of diametrically opposed aperatures therein, a side plate including means affixing said side plate to said flue, said side plate having an aperature disposed in co-axial alignment with said flue aperatures, a slotted clip including means affixing said

clip to said plate, a latch including means for pivotally mounting to said side plate, said side plate including stop means for said latch, said flue having a damper plate with a generally circular periphery of diameter somewhat less than the inside diameter of said flue, a damper shaft extending through said flue aperatures and said side plate aperature in rotational relation therein, said damper shaft including means engagable with said damper plate for non-rotatable relation therein, a yoke having a base with extending legs, said legs having aperatures therein in co-axial alignment, said damper shaft extending through said yoke leg aperatures, a bushing having a bore, said bushing affixed outboard of one said yoke leg in co-axail alignment with said aperature therein, said bushing receiving said damper shaft, means securing said bushing to said damper shaft in fixed relation thereto, said bushing diametrically opposite said side plate, said damper shaft having a handle at one end, a helical compression spring receiving said damper shaft and co-acting between said handle and said yoke leg, said spring means insuring said means engagable between said damper plate and said damper shaft, a pair of aperatures disposed at said yoke base in co-axial alignment parallel to the axis of said damper shaft, a shaft extending through said aperatures in rotational relation thereto, a knurled wheel affixed to one projecting end of said shaft, means engagable with said latch, a helically shaped bimetal strip in co-axial alignment with said shaft, said bimetal strip affixed at one end to said yoke base and at other end to said shaft, said bimetal strip being responsive to changes in temperature of said flue to rotate said wheel for disengagement of said latch, a bead chain pivotally secured at one end to said yoke leg, said chain engaged in said clip slot for predetermined travel limit of said yoke for closing of said damper plate, said yoke base having housing means to enclose said bimetal strip against said flue when said damper plate is in an open position, said flue having a heat shield including means affixing to said flue, said heat shield reducing thermal radiation from said flue to said bimetal strip when said damper plate is in a closed position.

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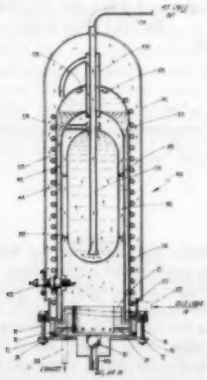
**4,479,484**

## PULSING COMBUSTION

**Robert E. Davis, Mountain Home, Ark., assignor to Arkansas Patents, Inc., Mountain Home, Ark.**

**Filed Dec. 22, 1980, Ser. No. 218,849**
**Int. Cl.³ F24H 1/00**
**U.S. Cl. 126—362** **3 Claims**



1. A heating device comprising:

a pulsing combustion device including means for defining a combustion chamber, a poppet valve mounted in said combustion chamber for reciprocation, means for supplying a pressurized combustible mixture to said poppet valve, means for combusting said combustible mixture in said combustion chamber to produce pressurized combustion gases, said poppet valve being reciprocated in said combustion chamber by said pressureized combustible mixture and said pressurized combustion gases to regulate the flow of said combustible mixture into said combustion chamber;

first heat exchange means for heating a fluid in communication with said combustion chamber by said combustion gases;

second heat exchange means for selectively removing heat from said heated fluid, and

means for circulating said fluid through said first heat exchange means and said second heat exchange means;

said first heat exchange means including:

a first cold liquid inlet tube;

a hot liquid outlet tube;

an internal shell enclosing said combustion chamber, said first cold liquid inlet tube venting into said internal shell;

an external shell enclosing said internal shell, said hot liquid outlet tube communicating with said external shell;

passageway means for supplying said liquid from said internal shell to said external shell;

a second cold liquid inlet tube which exhausts cold liquid between said internal and external shells; and

an exhaust conduit for venting combustion gases from an exhaust tube of said combustion chamber, said exhaust conduit coiling around said internal shell to heat said internal shell and also heat the liquid from said second cold liquid inlet tube.

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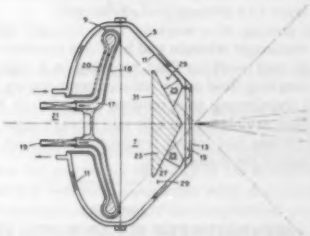
**4,479,485**

## POWER EFFICIENCY FOR VERY HIGH TEMPERATURE SOLAR THERMAL CAVITY RECEIVERS

**Allan R. McDougal, LaCanada-Flintridge, and Robert R. Hale, Upland, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 14, 1982, Ser. No. 368,245**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—439** **9 Claims**



1. Apparatus for absorbing a beam of concentrated solar power for utilization comprising:

a cavity receiver having internal reflective surfaces and an inlet for transmission of solar radiation into the cavity;

a radiation absorber having front and back surfaces mounted within the cavity;

a baffle provided with front and back reflective surfaces;

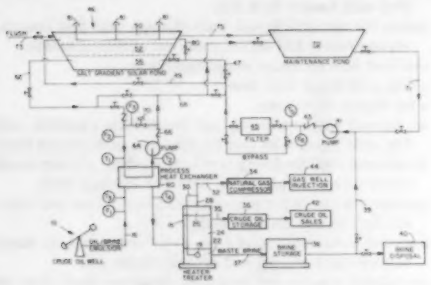
means for mounting said baffle within said cavity between said front surface of said absorber and said inlet enabling said front surface of said baffle to intercept directly substantially all of the radiation entering the cavity and reflect said radiation to said absorber via secondary reflection from the internal surfaces of the cavity and enabling said back surface of said baffle to intercept substantially all of the infrared radiation emitted from the front surface of the absorber.

**4,479,486**

## METHOD FOR UTILIZATION OF OIL FIELD WASTE BRINE TO DEVELOP A SALT GRADIENT SOLAR POND

**Robert A. Manning, and Thomas P. Wisneski, both of San Antonio, Tex., assignors to Applied Solar Engineering, Inc., San Antonio, Tex.**

**Filed Oct. 24, 1983, Ser. No. 544,474**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—415** **8 Claims**



1. A method for utilizing oil field waste brine to develop a salt gradient solar pond to provide thermal energy for doing work which comprises:

(a) collecting oil field waste brine from at least one crude oil production process;

(b) delivering said oil field waste brine to a pit;

(c) partially evaporating said oil field waste brine to achieve desirable brine concentrations in said pit;

(d) distributing said brine concentrations in generally horizontal layers within said pit such that a surface layer, a gradient layer and a storage layer are established, said surface layer having a lower concentration of brine, said gradient layer having intermediate concentrations of brine, and said storage layer having a higher concentration of brine;

(e) developing hot brine in said storage layer;

(f) transferring a portion of said hot brine from said storage layer to a process heat exchanger;

(g) passing of a working fluid through said process heat exchanger wherein said hot brine transfers thermal energy to said working fluid resulting in a higher temperature working fluid and a reduced temperature brine;

(h) transferring said reduced temperature brine from said heat exchanger back to said storage layer;

(i) passing said higher temperature working fluid through a motor for doing work.

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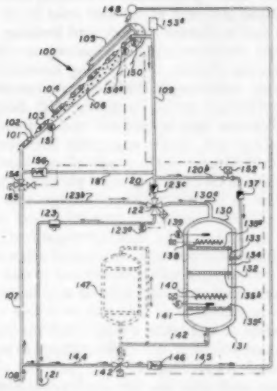
**4,479,487**

## APPARATUS FOR SOLAR WATER HEATING

**Ilya Migdal, 3366 Verlot Ter., Palo Alto, Calif. 94303**

**Filed Jun. 6, 1983, Ser. No. 501,114**
**Claims priority, application Israel, Jun. 9, 1982, 66014**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—422** **13 Claims**

1. Apparatus for solar water heating comprising a solar collector constructed to receive solar radiation and having a heat absorbing surface and a coil in heat conductive relation with said heat absorbing surface, said coil having a cold water inlet and a hot water outlet, a cold water supply line connected to said inlet; a storage tank for accumulating water heated by said solar collector, said storage tank having top, lower and intermediate ports; a first pipe connecting said outlet to a branched pipe, said branched pipe having a first branch and a second branch said first branch being connected to said intermediate port of said storage tank through a proportional-flow valve means, said proportional-flow valve means being open when the temperature at said outlet is greater than at said inlet; a multiway mixing valve connected to said second branch and to a second pipe, said second pipe leading to the upper part of said storage tank and to said cold water supply line, an outlet from said multiway mixing valve being connected to a discharge pipe, said multiway mixing valve being responsive to temperature in said outlet so that the temperature of water in said discharge pipe is above a pre-determined amount, and a three-way two-position valve connected to the cold water supply line and to said lower port of the storage tank, said



three-way two-position valve being opened and closed as said proportional-flow valve means is opened and closed; whereby water supplied to the consumer through said discharge pipe is always at a temperature above said predetermined amount by reason of said multiway mixing valve discharging hot water from said outlet or said top port at said predetermined amount and, when water is not being required by the consumer, water from said outlet is supplied to said intermediate port or said cold water supply line.

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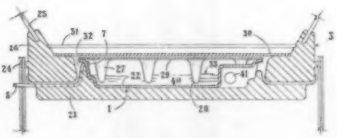
**4,479,488**

## ROTATABLE SOLAR-HEATED WATER CONTAINER

**Hyman A. Steinberg, 7200 NW. 78th St., Tamarac, Fla. 33319**

**Filed Apr. 2, 1982, Ser. No. 364,796**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—451** **19 Claims**



1. A substantially flat container for holding and boiling water within the positionable outer casing of a solar heating device, said container being watertight on all sides except for a capped fill opening and an unobstructed, permanently open pouring spout for the relief of steam pressure, said permanently open spout extending from a point inside said container to a point outside of said outer casing, when said container is within said heating device, said container having a metallic, heat-conductive wall parallel to its plane of flatness, said container being in upright position when its plane of flatness is vertical and said fill opening faces upward, said container having a maximum liquid volume capacity that is substantially less than its total interior volume and said container being rotatable 180 degrees around any horizontal axis drawn through its plane of flatness, from an upright position through all positions wherein

said heat-conductive wall faces upward, without spilling its contents out of said open spout.

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**4,479,489**

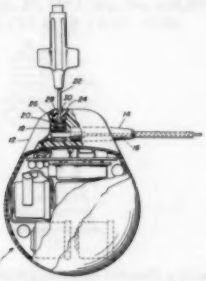
## MECHANICALLY SELF-SEALING CLOSURE

**Charles A. Tucci, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.**

**Continuation of Ser. No. 255,714, Apr. 20, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 477,597**

**Int. Cl.³ A61N *1/02***

**U.S. Cl. 128—419 P** **5 Claims**



1. In an implantable cardiac pacing apparatus comprising:

(A) a housing including a recess terminating at an electrical terminal block;

(B) means within said housing for generating cardiac stimulating electrical signals at said terminal block; and

(C) an electrical lead for attachment to said terminal block by means of a set screw within said recess;

mechanically self-sealing closure means for sealing said recess comprising an elastomeric plug consisting of:

(1) a first concave surface;

(2) a second opposing concave surface; and

(3) a self-sealing transverse slit extending from said first concave surface to said second opposing concave surface, said elastomeric plug sized for a compression fit within said recess, said compression fit generating a radially directed compression force on said plug causing changes in the material distribution of said plug, whereby said changes in said material distribution coupled with said first and second concave surfaces concentrate radial compressive forces generated by said compression fit to maintain an effective seal along said transverse slit.

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**4,479,490**

## CAST PADDING

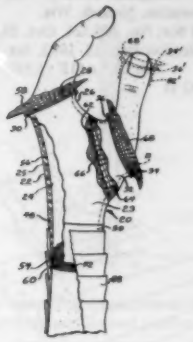
**Richard G. Dedo, 175 Denise Dr., Hillsborough, Calif. 94010**

**Filed Apr. 17, 1978, Ser. No. 897,231**

**Int. Cl.³ A61F *5/04***

**U.S. Cl. 128—89 R** **29 Claims**

1. Cast padding for use in forming a cast on a patient's extremity comprising, elongated sleeve means of a padding material being substantially more rigid than a stockinette material and defining a cavity to receive the patient's hand, said sleeve means having a palmar portion for covering a substantial portion of the patient's palm, a distal portion defining a distal opening communicating with said cavity to receive the patient's fingers, and a lateral portion extending a distance for the sleeve means and defining a lateral opening to receive the patient's thumb, said distal portion only extending to a location adjacent the distal palmar crease, said lateral portion only



extending to a location adjacent the distal end of the patient's thumb.

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**4,479,491**

## INTERVERTEBRAL STABILIZATION IMPLANT

**Felix M. Martin, 1124 Broadway, Quincy, Ill. 62301**

**Filed Jul. 26, 1982, Ser. No. 401,845**

**Int. Cl.³ A61F *5/04*; A61B *17/18***

**U.S. Cl. 128—92 B** **5 Claims**

1. An implant for the stabilization of a fractured and luxated cervical vertebra comprising:

a retaining member having a longitudinal portion extending at least the distance between the posterior of the body of a cervical vertebra adjacent to the fractured and luxated vertebra and the anterior of the body of the fractured or luxated cervical vertebra; a posterior wing downwardly disposed at an angle at one end of the longitudinal portion and adapted to be engaged by the posterior edge of the body of the adjacent cervical vertebra and a superior wing upwardly disposed at an angle at the other end of the longitudinal portion of said superior wing adapted to engage the superior edge the body portion of the fractured or luxated vertebra whereby the natural action of the muscles associated with the neck maintain the fractured or luxated vertebra in compression against the superior wing and the posterior wing engages the body portion of the adjacent vertebra to prevent slippage.

5. A method of stabilizing a fractured or luxated cervical vertebra comprising the steps of:

exposing the pre-vertebral space;

widely resecting the intervertebral disk in the intervertebral space; and

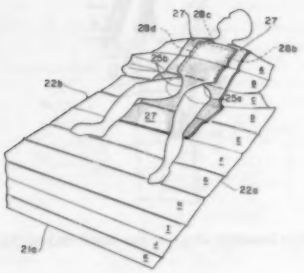
coupling the anterior portion of the body of the fractured and luxated vertebra to the posterior portion of the body of an adjacent lower vertebra.

**4,479,492**

## BILATERAL SPLIT SURGICAL DRAPE

**Wayne J. Singer, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Continuation of Ser. No. 200,324, Oct. 24, 1980, abandoned.**
**This application Dec. 13, 1982, Ser. No. 449,286**
**Int. Cl.³ A61F *13/00***
**U.S. Cl. 128—132 D** **2 Claims**




1. A disposable surgical drape for bilateral leg surgery comprising:

(a) a nonwoven sheet having side edges and end edges, the sheet having two substantially parallel fenestrations defining operative sites through each of which a leg of a patient may be exposed, said fenestrations having an open end and a closed end, said open end opening onto one end edge and said fenestrations extending longitudinally toward the middle of the sheet substantially parallel to the side edges with said closed ends being shaped to accomodate the patient's legs, the fenestrations being spaced apart forming a central flap that conforms to the spacing between a patient's legs;

(b) an absorbent, fluid impervious laminate attached to one surface of the nonwoven sheet, the laminate substantially surrounding the fenestrations in the nonwoven sheet, the laminate having two fenestrations conforming to and aligned with the two fenestrations in the sheet;

(c) tacky pressure sensitive adhesive on the surface of the nonwoven sheet opposite the laminate adjacent the edges and closed end of each said fenestrations; and

(d) removable adherent release strips covering the pressure sensitive adhesive whereby, once said drape is in use, both the patient's legs may be exposed through said fenestrations while the perineal area is covered by said central flap.

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**4,479,493**

## INHALATION APPARATUS FOR TEST ANIMALS

**Richard Bung, Ludwigshafen; Hartmut Giesbrecht, Gross-Sachsen; Wolfgang Leuckel, Bad Durkheim, and Hans-Joachim Klimisch, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Nov. 9, 1981, Ser. No. 319,710**
**Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044640**
**Int. Cl.³ A61D *7/04***
**U.S. Cl. 128—204.18** **11 Claims**

1. An inhalation apparatus for test animals, for investigating the biological effect of substances mixed with respiratory air, comprising:

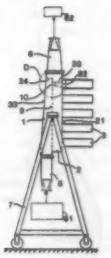
a distributor chamber which is to be connected to, and supplied with the mixture under pressure by, a respiratory air preparation unit,

a suction chamber which is to be connected to, and held under subatmospheric pressure by, a disposal system for removing the waste air and air from the environment,

said suction chamber being disposed adjacent to, and being secured to said distributor chamber, and having therein on its side facing the outside of said apparatus a plurality of apertures, and

said distributor chamber having therein on its side facing said suction chamber a plurality of openings in alignment with the corresponding apertures of said suction chamber, and

animal tubes having a head section, a trunk section and a transition section therebetween, and



means defining a channel extending between each said aperture in the suction chamber and the corresponding opening in the distributor chamber, said channel defining means receiving an animal tube in such a manner that, upon insertion of said animal tube through said aperture into said channel defining means, communication is established between the head section of said animal tube and the distributor chamber,

said transition section having holes through which the respective tube, upon insertion, communicates with the suction chamber so that by way of said holes both respiratory air passed through said head section and environmental air passed, in the opposite direction, through the open end of said trunk section, are withdrawn.

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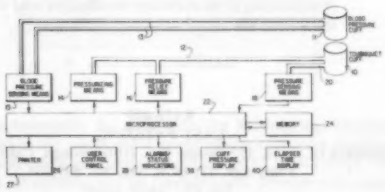
**4,479,494**

## ADAPTIVE PNEUMATIC TOURNIQUET

**James A. McEwen, Richmond, Canada, assignor to Western Clinical Engineering Ltd., Richmond, Canada**

**Filed Jan. 5, 1982, Ser. No. 337,152**
**Int. Cl.³ A61B *17/12***
**U.S. Cl. 128—327** **17 Claims**



1. A pneumatic tourniquet for employing the minimum safe pressure to occlude blood flow into a patient's limb, comprising:

an inflatable cuff;

pressurizing means for pressurizing said cuff;

pressure relief means for depressurizing said cuff;

cuff pressure sensing means for sensing said cuff pressure;

blood pressure sensing means for sensing the patient's systolic blood pressure; and

pressure regulator means responsive to variations in said systolic blood pressure for selectably activating said pressurizing means and said pressure relief means to maintain the cuff pressure above said systolic blood pressure and to maintain a substantially constant pressure difference between said cuff pressure and said systolic blood pressure.

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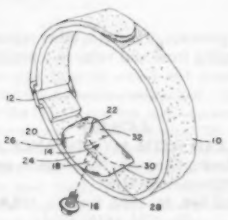
**4,479,495**

## ACUPRESSURE POINT STIMULATOR DEVICE

**Gary S. Isaacson, 1827 Haigt St., Suite 2, San Francisco, Calif. 94117**

**Filed Sep. 27, 1982, Ser. No. 424,573**
**Int. Cl.³ A61B** *17/12, 17/34*
**U.S. Cl. 128—327** **16 Claims**




1. An accupressure device for applying continuous pressure to a specific spot on an animal's body, comprising:

an elongated solid-body stimulator having front and back sides, said back side having a convex curvature, said front side being on the opposite side of said solid-body from said back side thereof and comprising a protuberance, the end of said protuberance distal from said back side having a terminus, said terminus being asymmetrically positioned on said front side toward one end of said elongated solid body,

means for holding said solid-body stimulator against said animal's body so that said terminus of said protuberance is in contact with said specific spot thereon, said means arranged to apply continuous pressure to a symmetrically-positioned spot on said back side of said stimulator, whereby said stimulator can be positioned to apply pressure at an angle to said animal's body so that a point behind or on a posterior margin of a bone can be stimulated.

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**4,479,496**

## ACUPUNCTURE NEEDLE AND NEEDLE GUIDE ASSEMBLY

**John J. Hsu, 7224 Old Mill Rd., Birmingham, Mich. 48010**

**Filed Apr. 22, 1982, Ser. No. 370,682**
**Int. Cl.³ A61B** *17/34*
**U.S. Cl. 128—329 A** **16 Claims**

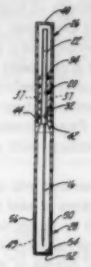
1. An acupuncture needle and needle guide assembly comprising:

a needle;

an elongated handle having a first axial portion secured to one end of said needle;

a tubular housing having a first bore portion appropriately dimensioned to frictionally engage said first portion of said handle, and a second elongated portion adjacent said first bore portion and dimensioned to enclose said needle therein;

first means for manually slidably displacing said handle in a direction toward said second portion of said housing; and



second means for restricting displacement of said handle in a direction away from said second portion of said housing.

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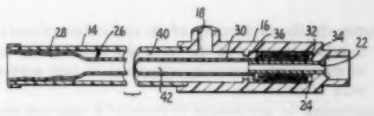
**4,479,497**

## DOUBLE LUMEN DILATATION CATHETER

**Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304, and Albert K. Chin, San Francisco, Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.**

**Filed Nov. 12, 1982, Ser. No. 440,824**
**Int. Cl.³ A61M** *29/02*
**U.S. Cl. 128—344** **6 Claims**




5. A catheter comprising an elongated tubular catheter body, a catheter housing secured to the body, an open-ended tubular member carried by said housing axially therein, annular balloon means extending along the interior of said body into said housing, said balloon means having the distal end portion thereof peripherally sealed to the distal end portion of said body and having the proximal end portion thereof secured to the interior of said housing through a pleated tubular section of said proximal end portion sleeved over said tubular member, and means to introduce pressurized fluid between said body and balloon means to cause said balloon means to elongate and the distal portion thereof to evert from said body and then to expand, said pleated section being adapted to be depleated relative to said tubular member during elongation of said balloon means and said catheter having a permanently open central lumen defined by said balloon means and the tubular member.

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**4,479,498**

## METHOD OF SPINAL RADIOMETER ANALYSIS AND CORRECTIVE ADJUSTMENT

**Irwing N. Toftness, 1425 Second Ave., Cumberland, Wis. 54829**

**Filed Aug. 27, 1982, Ser. No. 412,158**
**Int. Cl.³ A61B** *6/00*
**U.S. Cl. 128—653** **7 Claims**

1. The method of analysis and corrective adjustment for relief of nerve interference in the human body, consisting of the steps of

positioning the body of the patient,

scanning subcutaneous microwave emissions from the spinal column area of the patient,

collecting and converting said emissions into a measured visual output representing a pattern of the intensity of emissions of the spinal column,

providing a visual reference of a normal pattern of said emissions for comparison with said output of said spinal column,

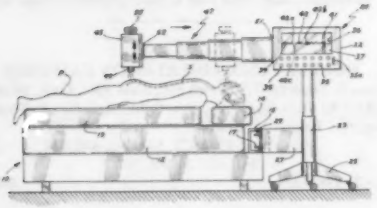
observing the deviations of said output compared with said normal pattern of emissions, said deviations representing microwave emissions which pinpoint stress areas,

applying corrective adjustment to said spinal column to the portions thereof corresponding to the points of said deviations, said corrective adjustment consisting of placing oblique thumb or finger pressure upon a point of the spinal column corresponding with a point of deviation of said emissions,

collecting and converting into a visual measured output the microwave emissions at said point of applied pressure,

pivoting said thumb or finger upon said point to apply said pressure in various radial directions,

observing the visual output of microwave emissions at each radial direction of application of pressure,



noting the line of direction of the application of said pressure in which is achieved the maximum reduction of deviation of microwave emissions compared to said normal reference of emissions,

continuing the application of pressure in said last mentioned line of direction until the reduction in microwave emissions is sustained,

repeating the steps of ascertaining and applying pressure in the radial line of direction to achieve a maximum reduction of deviation in microwave emissions at each point of deviation of emissions from said normal reference of emissions, and

scanning said spinal column at the completion of adjustment comparing the visual output of emissions to said normal reference of emissions to determine the effect of the corrective adjustment.

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**4,479,499**

## METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF CARIES IN TEETH USING VISIBLE LIGHT

**Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463**

**Filed Jan. 29, 1982, Ser. No. 343,874**
**Int. Cl.³ A61B *6/00***
**U.S. Cl. 128—665** **2 Claims**

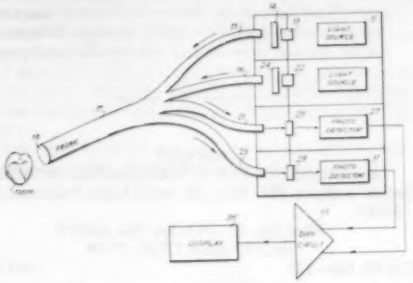
1. A method for detecting the presence of caries of the teeth of a person comprising:

radiating a region of the teeth to be examined with light;

producing first and second signals corresponding to the intensity of the light scattered at first and second wavelengths, respectively, the intensity of difference of the scattered light between caries and non-carious regions at said first wavelength being measurably different than the intensity difference of the scattered light between caries and non-carious regions at said second wavelength;

producing a third signal corresponding to the difference between said first and second signals;

determining the value of said third signal when a known non-carious region is radiated;



detecting the presence of caries in other regions by said third signal changing from said value in a predetermined manner.

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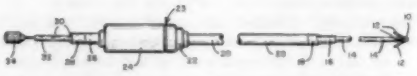
**4,479,500**

## PACING LEAD WITH A-V DISTANCE ADAPTER

**Karel F. A. A. Smits, Oirsbeek, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Sep. 16, 1982, Ser. No. 418,926**
**Int. Cl.³ A61N *1/04***
**U.S. Cl. 128—786** **13 Claims**



1. A lead for dual chamber pacing comprising:

an insulated first sheath having a proximal end and a distal end;

a first conductor, having a proximal end and a distal end, mounted within said first sheath;

a first electrode electrically coupled to the distal end of said first conductor, exposed to the exterior of the distal end of said first sheath;

a connector assembly mounted fixedly to the proximal end of said first sheath comprising:

a first connector electrically coupled to the proximal end of said first conductor; and

a second connector;

an insulated second sheath having a proximal end, a distal end, a lumen, and an aperture connecting said lumen to the exterior of said second sheath, distal to the proximal end of said second sheath, said second sheath mounted slideably around said first sheath, the proximal end of said second sheath fixedly attached to said connector assembly, the distal end of said first sheath exiting through and protruding from the aperture of said second sheath;

a first expandable means for variation of the length of the portion of said second sheath lying between the proximal end of said second sheath and the aperture of said second sheath whereby the distance said first sheath protrudes from the aperture of said second sheath may be varied;

a second conductor, having a proximal end and a distal end, mounted within said second sheath exterior to said first sheath, electrically coupled to said second connector;

a second expandable means for allowing variation of the length of said second conductor, said second expandable means comprising a segment of said second conductor having axial flexibility; and

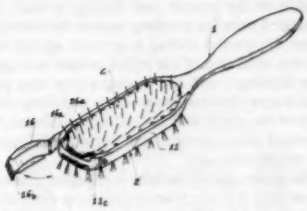
a second electrode coupled to the distal end of said second conductor, exposed to the exterior of said second sheath.

**4,479,501**

## CASSETTE TYPE HYGIENIC COMB AND BRUSH

**Horng Y. Chern, 10-4 Fl., No. 62, Chang-Chun Rd., Taipei, Taiwan**

**Filed Apr. 5, 1982, Ser. No. 365,831**
**Int. Cl.³ A45D *44/18***
**U.S. Cl. 132—85** **10 Claims**



1. A cassette type hygienic comb and brush comprising: a basic body (1) having a handle portion and a back portion (10) extending from the handle portion; and a cassette bristle holder (2) having a plurality of thin film layers (26) removably held atop on a bristle base (21) engaged with the back portion (10) of said basic body (1), and having plurality of bristles (27) extending from said bristle base (21) through said thin film layers so that the uppermost layer can be torn to remove the dirts accumulated thereon and said cassette bristle holder can be replaced with the new holder after completely tearing off said thin film layers therefrom.

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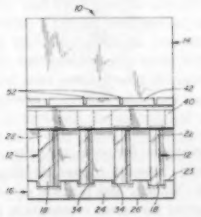
**4,479,502**

## COIN-HOLDER

**Ronald K. Iversen, 830 Craigflower St., Victoria, B.C., Canada V9A 2W8**

**Filed Dec. 29, 1982, Ser. No. 454,400**
**Int. Cl.³ G07D *9/06***
**U.S. Cl. 133—1 A** **1 Claim**



1. A coin holding device comprising, in combination:
a plurality of cylindrical, transparent tubes having different internal diameters for holding coins of different denominations in an axially stacked relation;
a stand for supporting said tubes in an upright position, said stand including:
a backing member having an upper end and a lower end;
an elongated base having a top surface, and a front surface, said base extending forwardly of the lower end of said backing member, said top surface having a plurality of cylindrical recesses each adapted to loosely receive the lower end of one of said tubes and a groove associated with each cylindrical recess, each groove extending from its associated recess to said front surface and being of lesser depth than its associated recess;
an elongated head member extending along a side of said backing member about midway thereon parallel to said base member and spaced therefrom, said head member having a front surface, a bottom surface and an upper surface, a plurality of cylindrical recesses in said bottom surface axially aligned with the cylindrical recesses in said base for telescopingly receiving the upper ends of said tubes and narrow slot means in said upper surface communicating with said recesses in said head member for feeding coins to said tubes via said recesses, said slot means being of a width slightly greater than the coins to be stored.

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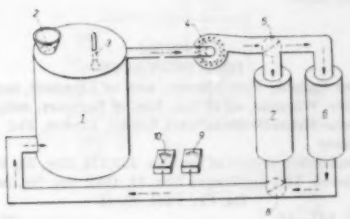
**4,479,503**

## RESTORATION OF STONE OBJECTS

**Maurizio Pouchain, Via Casal del Marmo, 660, 00166 Roma, and Ludovico Medolago Albani, Via Sabrata, 22, 00198 Roma, both of Italy**

**Filed Jul. 18, 1983, Ser. No. 514,896**
**Claims priority, application Italy, Jun. 1, 1983, 48405 A/83**
**Int. Cl.³ B08B *7/04***
**U.S. Cl. 134—2** **4 Claims**



1. A process for the restoration of a stone monument or stone object contaminated by calcium sulfate comprising immersing the object in deionized water so as to dissolve the calcium sulfate in solution, then circulating the water containing the dissolved calcium sulfate through an ion exchange resin which selectively traps the sulfate ion and releases calcium hydroxide into the solution according to the equation:

$$CaSO_4 \rightleftharpoons Ca^{++} + SO_4^{--} \rightarrow \text{ion exchange resin} \rightarrow Ca^{++} + 2OH^-$$

and then circulating the ion-exchanged water in a circulatory system back into contact with the monument or object and subsequently exposing the monument or object to carbon dioxide under controlled conditions sufficient to cause reprecipitation of the calcium ion on the monument or object as the carbonate in calcite crystalline form.

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**4,479,504**

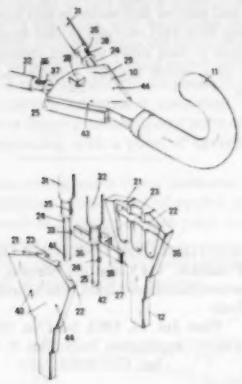
## RELEASE DEVICE OF DOUBLE-SHADE UMBRELLA

**Goan Harng, No. 170, Pei Ning Rd., Ho Mei, Chang Hua Hsien, Taiwan 508 R.O.C.**

**Filed Sep. 21, 1983, Ser. No. 534,438**
**Int. Cl.³ A45B *19/00, 25/14***
**U.S. Cl. 135—20 A** **2 Claims**

1. A release device of double-shade umbrella comprising an umbrella handle having three long elliptical holes and a cross slot, two telescopic umbrella canes inserted in the elliptical holes and having retainers, and a T plate in the cross slot with its release key coming out of the front side of the handle, said

retainers having their key heads against the T plate so that when the release key of the T plate is pressed, the retainers will



be forced to retreat and release the outer tubes of the telescopic umbrella canes.

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**4,479,505**

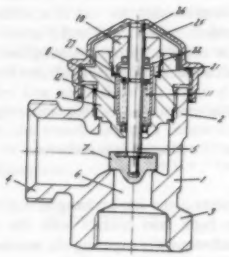
**HEATING VALVE**

**Manfred Kasprik; Paul Mintert, both of Lippstadt, and Klaus Werner, Warstein, all of Fed. Rep. of Germany, assignors to Theodor Heimeier Metallwerk GmbH, Erwitte, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 333,124, Dec. 21, 1981, abandoned. This application Feb. 17, 1982, Ser. No. 349,624**

**Int. Cl.[3] F16L *55/18***

**U.S. Cl. 137—15** **10 Claims**



1. A heating valve comprising

a valve body having a plurality of connecting branches;

a valve seat disposed inside the valve body toward a connecting branch;

a bonnet seated in a connecting branch disposed opposite to the valve seat and having an inner step bore narrowing toward the side of the valve seat;

a valve stem passing through the center of the bonnet; a valve plug disposed at the end of the stem for forming together with the valve seat a closure;

a tube having an inner annular bottom extension and an inner annular top extension formed as a single piece, the tube surrounding the stem and pressing with its bottom against a step of the bore of the bonnet;

a first O-ring disposed between the bonnet, the stem and the bottom of the tube;

a stop ring attached to the stem and disposed inside the tube;

a compression spring disposed inside the tube and pressing against the inner annular bottom extension and against the stop ring such that the valve can be shut off against the force of the compression spring, where the stem, the stop ring, the compression spring and the tube form a preassembled unit;

a second O-ring surrounding the stem and disposed immediately above the inner annular top extension of the tube rolled-in toward the stem;

a packing nut bolted into the bonnet, surrounding the stem, providing seals by pressing against a circular lip at the upper side of the bonnet, and having a small diameter inner stepped bore for pressing against the second O-ring such that the second O-ring is pressed against the inner annular top extension of the rolled-in tube and against the stem for forming a seal and having a step bore providing a second larger diameter inner recess matching the rolled-in radius of the upper annular end of the tube and providing a contact area of the packing nut with the upper annular end of the tube; and

wherein the upper end of the tube is engaged concentrically by the packing nut, the inner annular top extension of the tube is deformed by turning in of said packing nut with the step bore pressing against the tube such that the tube coacting with the packing nut is pressed against the first O-ring for forming a seal.

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**4,479,506**

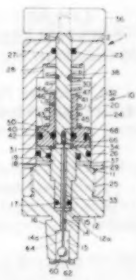
**CONDUIT BLOWOUT PREVENTER**

**Kip B. Goans, Harvey, La., assignor to Baker Cac, Inc., Belle Chasse, La.**

**Filed Aug. 9, 1982, Ser. No. 406,758**

**Int. Cl.[3] F16K *17/40***

**U.S. Cl. 137—73** **19 Claims**



1. A blowout preventer for series insertion in a fluid pressure conduit; comprising: housing means defining a vertical axis, cylindrical walled chamber and ports at opposite axial ends of said chamber adapted for series connection in a conduit with the lower port adapted to communicate with a fluid pressure source to be monitored and the upper port adapted to connect to the conduit; a cylindrical support rod coaxially mounted in said chamber; an annular piston slidably but not sealably mounted on said support rod, thereby defining a restricted width annular fluid passage communicating between said ports; said cylindrical walled chamber having an upper end wall surrounding said support rod; sealing means on the outer periphery of said piston cooperating with the cylindrical wall of said cylindrical walled chamber, whereby a biased fluid flow through said restricted width annular fluid passage produces a pressure differential across said annular piston to produce an upward movement of said annular piston to sealingly abut said upper end wall; an orifice extending radially through said annular piston wall into said annular fluid passage to permit limited fluid flow through said annular fluid passage when said piston abuts said upper end wall, and resilient means urging said annular piston downwardly whereby said annular piston returns to its down position upon termination of said pressure differential.

4,479,507

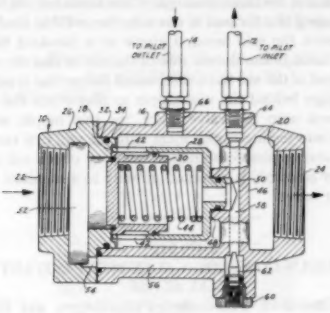
## FLUID PRESSURE OPERATED VALVE

Jimmy B. Nichols, Statesboro Township, Bulloch County, Ga., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 278,891, Jun. 29, 1981, Pat. No. 4,418,839. This application Sep. 6, 1983, Ser. No. 529,217

Int. Cl.³ F16K 1/12

U.S. Cl. 137—220 4 Claims



1. A fluid pressure operated valve device for connection to the inlet and outlet sides of a meter actuated pilot valve and for dispensing a predetermined quantity of liquid at rates determined by the meter; comprising a two part axially separable and detachably connected hollow cylindrical body having inlet and outlet end walls and axially aligned inlet and outlet passages therethrough, and a bar extending diametrically across said body and spaced from but adjacent said outlet end wall, a hollow cylindrical liner of smaller outside diameter than the inside diameter of said body arranged substantially concentrically in said body, said liner having a closed end and an open end with its closed end attached to said bar and its open end abutting said inlet end wall, and said liner having ports in the wall thereof adjacent its open end, a biased closed hollow cylindrical valve element arranged for slidable reciprocation in said liner and arranged to control said ports, said valve element having a closed end and an open end with its closed end facing said inlet passage, connecting passageway means in said body, said bar and said liner providing communication between said inlet passage and the interior of said liner, connecting passageway means in said liner and said bar providing communication between the interior of said liner and the exterior of said body, and connecting passageway means in said body providing communication between the exterior of said body and said outlet passage.

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4,479,508

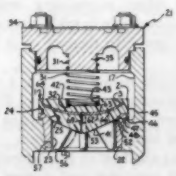
## REINFORCED VALVE MEMBER

William F. Breed, Enid, Okla., assignor to George E. Failing Company, Enid, Okla.

Filed Sep. 29, 1982, Ser. No. 427,175

Int. Cl.³ F16K 15/02

U.S. Cl. 137—516.25 12 Claims



1. A reinforced mud pump valve member, which comprises:

(a) a body including:

(1) an upstream side;

(2) a downstream side;

(3) a flat annular rim terminating upstream at a first flat, annular sealing surface; and

(4) a frusto-conical portion extending upstream from said first sealing surface and having a bevelled second sealing surface; and

(b) a dish-shaped reinforcing washer convex toward said upstream side and concave toward said downstream side and entirely embedded within said valve member body.

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4,479,509

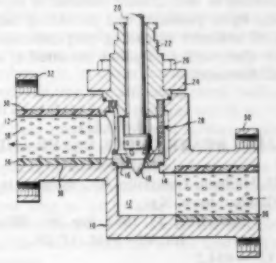
## FLUID CONTROL APPARATUS

Terrence A. Dear, Elkton, Md., and Allan B. Hughes, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 290,082, Aug. 3, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 369,913

Int. Cl.³ F16K 47/02; F16L 55/02

U.S. Cl. 137—560 14 Claims



1. In a valve including, as elements thereof, a body with a passage therethrough, a seat in the passage, a solid plug movable toward and away from the seat, and a seat-retaining cage surrounding the plug, all of said elements having exposed surfaces in said passage, the improvement comprising provision of tuned, blind holes in the surface of said cage, said holes being disposed angularly in the intended direction of flow through said passage and inclined with respect to said surface of the cage.

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4,479,510

## ATTENUATING ROTATING VALVE HAVING VARYING CONFIGURATIONS

Roger Bey, 19, Rue des Rossignols, 68110 Illzach, France

Continuation-in-part of Ser. No. 103,182, Dec. 11, 1979,. This application Oct. 14, 1980, Ser. No. 196,275

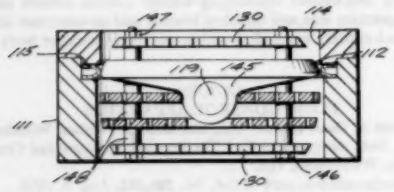
Claims priority, application Finland, Jan. 10, 1979, 790084; Jul. 1, 1980, 802109

Int. Cl.³ F16K 47/04

U.S. Cl. 137—625.31 17 Claims

1. An attenuator valve assembly comprising: a valve body having a flow passage formed therethrough; a closure member comprising a butterfly valve disc; means for mounting said closure member in said valve body for rotation about an axis with respect to said valve body between a completely open position wherein said closure member allows passage of fluid therepast through said flow passage, and a completely closed position wherein said closure member blocks all flow through said flow passage; sealing means provided in said valve body flow passage for operatively engaging said closure member for preventing fluid flow through said flow passage past said closure member when said closure member is in said closed position; means for attenuating fluid flowing through said flow passage past said closure member, without significantly re-

stricting flow when said closure member is in said completely open position, said means comprising perforated barrier means comprising a plurality of perforated plates mounted with said closure member and spaced from each other in the direction of the flow passage when said closure member is in said closed position; and means for mounting said perforated plates with respect to said closure member so that the attenuating effect of




said perforated plates is immediately called into play when said closure member is first opened and the attenuating effect thereof is great during initial opening of said closure member, and diminishes as said closure member is moved toward said completely open position, said mounting means including a plurality of fasteners extending perpendicular to the face of said valve disc, with said plates mounted at spaced positions along said fasteners.

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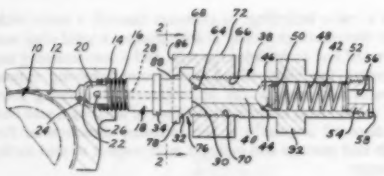
**4,479,511**

## ONE-MAN BRAKE CHECK VALVE AND COUPLER ASSEMBLY

**Marion D. Holland, Louisville, Ky., assignor to Robert E. Robbins, Elizabethtown, Ky.**

**Filed May 21, 1982, Ser. No. 380,650**
**Int. Cl.³ F16L *37/28***
**U.S. Cl. 137—614.2** **3 Claims**




1. A combination one-way check valve and coupler assembly adapted for direct locking engagement with a standard hydraulic brake bleeder valve for use by one person operating the brake pedal in bleeding air from wheel brake cylinders on wheeled vehicles without allowing air to reenter the brake cylinder when the brake pedal is released, said one-way check valve comprising:

a. an elongated valve body having a longitudinal passage extending completely therethrough with an inlet at one end of the body that is furnished with a first recessed valve seat,

b. said longitudinal passage having a first section of relatively small bore extending inwardly from said inlet end and being furnished with a second recessed valve seat at the innermost end of said first section,

c. said longitudinal passage having a second section of relatively larger bore that extends from the said second recessed valve seat to an outlet at the opposite end of the said valve body, said second passage section including a movable valve element and a biasing spring that normally holds the said valve element closed on the second recessed valve seat, and a perforated outlet cap mounted within the outlet end of the second bore for anchoring the biasing spring while allowing the free discharge of brake fluid;

d. and an adjustable coupler means carried by the inlet end of the said valve body, said coupler means being movable between a first open position and adapted for receiving a beveled nipple of a standard brake bleeder valve, and a second closed position which is adapted to clamp the said bleeder valve nipple into sealing engagement with the said first recessed valve seat of the valve body;

e. said adjustable coupler means comprising an internally threaded nut that is threaded onto the inlet end of the said valve body, the outermost end of the threaded nut having a T-shaped slot formed in one side thereof that is adapted to receive the said beveled nipple of a standard bleeder valve through the slotted side of the nut so that the outermost end of the nut has a three-sided flange that is adapted to engage behind the said nipple so that when the nut is tightened onto the valve body, the said nipple will be drawn into sealing engagement with the said first recessed valve seat so this combination one-way check valve and coupler assembly is mounted directly to a standard brake bleeder valve.

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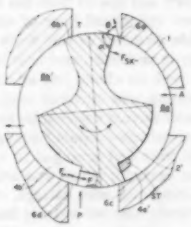
**4,479,512**

## CONTINUOUS CONTROL VALVE WITH ROTARY OR AXIAL SLIDE

**Johannes Ohrendorf, Freudenberg-Plittershagen, and Harald Wagner, Kreuztal-Fellinghausen, both of Fed. Rep. of Germany, assignors to Elektro-Mechanik GmbH, Fed. Rep. of Germany**

**Filed Mar. 11, 1982, Ser. No. 357,333**
**Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3109116; Nov. 3, 1981, 8106808[U]**
**Int. Cl.³ F16K *11/085***
**U.S. Cl. 137—625.17** **11 Claims**



1. A continuous control valve comprising:

a casing having a valve slide cavity and a plurality of ports each with an opening communicating with said cavity, each port opening bounded by a plurality of limiting edges, at least one of said ports comprising an inlet port, at least one of said ports comprising an outlet port and at least one of said ports comprising an additional port extending in said casing;

a valve slide movable in said cavity in a control direction to vary a flow passage cross-sectional area in each port opening, said slide having a plurality of grooves each with a rectangular cross-section in a plane transverse to a plane containing said control direction, a plurality of control edges transverse to said control direction and a plurality of connecting edges connecting ends of said control edges, said slide movable in said control direction to move said control edges with respect to at least some of said limiting edges;

said slide positionable in said cavity at a selected position in a direction transverse to said control direction to establish a selected amount of overlap between said control edges and said at least some limiting edges;

each groove being shallow in the vicinity of said inlet and said outlet port openings and deeper in the vicinity of openings of said additional port, each groove having a groove surface extending at an acute angle ($\alpha$) with re-

spect to an outer surface of said valve slide in the vicinity of said additional port opening, said groove surface extending in a direction to enlarge each groove in the vicinity of said additional port opening.

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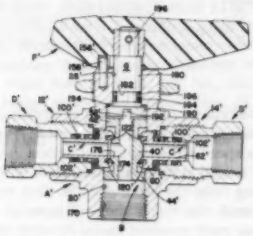
**4,479,513**

## HIGH PRESSURE BALL VALVE

**Ulrich H. Koch, Bainbridge Township, Cuyahoga County; Peter C. Williams, Cleveland Heights, and Gilbert F. Lutz, Chesterland, all of Ohio, assignors to Whitey Co., Highland Heights, Ohio**

**Filed Aug. 28, 1981, Ser. No. 297,220**
**Int. Cl.³ F16K** *5/06, 25/00*
**U.S. Cl. 137—625.47** **23 Claims**



1. A high pressure ball valve comprising:

a valve body having a cylindrical first flow passageway and a cylindrical central passageway extending therethrough in a generally normal relative relationship and in communication with each other, the opposite ends of said first passageway defining a pair of valve body branches;

a valve closure member received in said central passageway and being selectively rotatable about the central passageway axis, said closure member having a spherical ball portion disposed in said first passageway and a pair of cylindrical trunnions disposed on opposite sides of said ball portion in said central passageway, said ball portion including a fluid passage therethrough and one of said trunnions including means for connecting said closure member to control means;

control means in operative communication with said valve closure member connecting means for allowing selective rotation of said closure member to move said fluid passage in said ball portion between valve open and closed conditions;

a pair of radially inward extending annular shoulders in said first passageway located generally equal distances from said ball portion, each said shoulder being circumferentially continuous and having a surface normal to the axis of said first passageway facing said ball portion;

a pair of seat ring carriers disposed in said first passageway with one of said carriers positioned at each area of communication of said first passageway with said central passageway, each carrier including an axial fluid flow opening therethrough and a radially outward extending annular face compatible with and facing the said surface of an associated one of said shoulders, said carriers each further including an annular seat ring receiving groove facing said ball portion and a cylindrical tail portion extending axially of said first passageway away from said ball portion in a radially inwardly spaced relation to said first flow passageway to form a cylindrical seal chamber;

a plurality of partially stressed disc springs interposed between each shoulder surface and the annular face of the associated carrier for urging said carriers axially of said first passageway toward said ball portion, each disc spring having a central opening and in its unstressed condition having a truncated conical shape, said disc springs being positioned so that the smaller diameter ends of alternating ones thereof face in opposite directions;

a deformable annular seat ring closely received in the seat ring receiving groove of each carrier with said seat rings each including a continuous engaging surface facing said ball portion and wherein said engaging surface has a spherical conformation in its unstressed condition of a radius less than the radius of said ball portion, said seat ring engaging surfaces being urged into sealing contact so that said surfaces first contact with said ball portion at about the outer diameter of said surfaces during assembly and such contact widening from the outer diameter radially inwardly toward the inner diameter of said surfaces under the influence of said disc springs and fluid pressure loads, said sealing contact occurring at least at a diameter across the engaging surface of each seat ring which is smaller than the diameter across the associated seal chamber, said seat rings locating said closure member ball portion in said first passageway and retaining said closure member in said central passageway;

seal means interposed between each carrier tail portion and the valve body, in the associated seal chamber, and said seal means each including at least one annular seal ring adapted to be axially shifted between defined limits in response to fluid pressure exerted thereagainst; and,

means providing upstream fluid pressure to the upstream one of said seal chambers upstream of its seal means when said closure member is in its closed condition to further urge the associated seat ring toward engagement with said ball portion with a net fluid force, the area which provides the net force of fluid pressure for such further urging being limited to a predetermined annular area which will prevent the application of destructive compressive loads to the seat ring, and said predetermined annular area for said upstream seat ring in said valve closed position being defined between the diameter across the associated seal chamber and the inside diameter of the upstream seat ring engaging surface.

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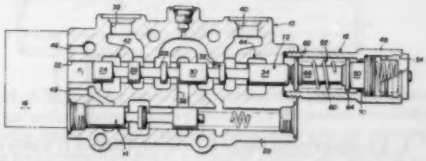
**4,479,514**

## FLOAT POSITIONING ASSEMBLY FOR PILOT OPERATED VALVE

**Milton C. Bennett, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.**

**Filed Jun. 7, 1982, Ser. No. 386,122**
**Claims priority, application Japan, Apr. 18, 1981, 56-56001**
**Int. Cl.³ F15B** *13/042*
**U.S. Cl. 137—625.63** **1 Claim**



1. In a proportional flow control valve including an axially slidable valve spool which is displaced to a plurality of positions by a pilot servo actuator for controlling fluid flow from a pump to a double-acting hydraulic cylinder to actuate the hydraulic cylinder for performing a function, the improvement comprising:

a float positioning assembly connected to said flow control valve in axial alignment with said slidable valve spool, said float positioning assembly including a differential piston which is positioned between a centering spring assembly and a stop member within a housing, and wherein the cross-sectional area of said differential piston being greater than the cross-sectional area of said valve spool;

said centering spring assembly including an elongated rod-

like support member which is secured at one end to said axially slidable valve spool, said support member having an enlarged abutment at its opposite end which is movable within an opening through said differential piston, a centering spring surrounding said support member, said centering spring being mounted between a first collar which is mounted on said support member adjacent to its one end and a slidable collar which is slidably movable on said support member against said enlarged abutment and against said differential piston;

a spring having a low spring rate located between said stop member and said differential piston to initially locate said differential piston in engagement against an interior annular abutment within said housing;

said valve spool being linearly displaced to a first position for compressing said centering spring between said first and slidable collars and said differential piston remaining in engagement against said abutment, and wherein said first collaar includes a sleeve and said centering spring surrounding said sleeve, said sleeve being movable into engagement with said slidable collar when said valve spool is linearly displaced to said first position; and

said valve spool being linearly displaced to a second position beyond said first position with said differential piston being moved by said centering spring assembly against said stop member and said centering spring being carried with said displaced centering spring assembly and differential piston.

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**4,479,515**

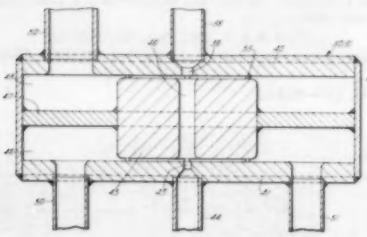
## FLUIDIC CONTROL DEVICES

**John R. Tippetts, Sheffield, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Continuation of Ser. No. 15,600, Feb. 27, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,622**

**Int. Cl.³ F15C** *1/20, 1/18*

**U.S. Cl. 137—824** **7 Claims**



1. A multi-terminal fluidic flow control device in which two of the terminals communicate respectively with nozzles opposing each other in axial alignment across an interspace characterized in that a third terminal communicates with a radial diffuser opening into and encircling the interspace to receive a substantially continuous power output flow of analog characteristics resulting from interaction of flows in the interspace, the radial diffuser having opposed annular surfaces forming a gap and between which to collect and channel the flow received therein radially to provide at the third terminal the analog output flow which is variable progressively in accordance with variation of the relationship of flows through the nozzles, and the interspace being elongated axially to form a mixer tube between one of the nozzles and the radial diffuser and a fourth terminal, acting as a vent in communication with the mixer tube.

**4,479,516**

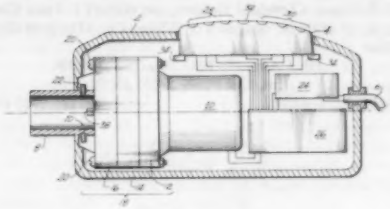
## ELECTRICALLY DRIVEN TOOTHBRUSH

**Frank M. Hunter, c/o Nunyara Medical Center, Church St., Terrigal, Austria 2260**

**Filed Feb. 8, 1982, Ser. No. 346,779**

**Int. Cl.³ A45D** *44/18*

**U.S. Cl. 132—84 R** **6 Claims**



1. An electrically driven toothbrush comprising a stationary handle part which supports an electric motor, a motor reversing means and a speed reducing means; a stem extending from the handle part a head at one end of the stem with an array of bristles extending from the head, and the stem imparts rotary motion to the head, the rotary motion imparted by the stem being continuous until reversed manually with the motor reversing means, the speed reducing means being a gearbox driven by the motor and there is between the gearbox and the stem a coupling affording releasable driving connection to interchangeable stems, the gearbox being an epicyclic gearbox with a carrier plate which is rotatable at one speed and a coaxial sun gear shaft which revolves at the other speed for any given motor speed, the carrier plate and shaft constituting one half of the coupling, the remaining half of the coupling being constituted by the driven end of the stem or the driven end of the drive means supported by the stem, those halves incorporating interfitting conformations.

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**4,479,517**

## LOW PROFILE CIRCULAR LOOM

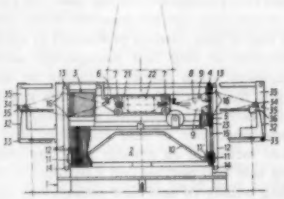
**Alfred Plammer, Seewalchen; Hermann Weiss, Lenzing; Adolf Schachinger; Johann Schönberger, both of Timelkam; Johann Bloo, Rosenau, and Bruno Mistlberger, Vöcklabruck, all of Austria, assignors to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria**

**Filed Sep. 29, 1982, Ser. No. 426,284**

**Claims priority, application Austria, Nov. 25, 1981, 5064/81**

**Int. Cl.³ D03D** *37/00, 47/26*

**U.S. Cl. 139—13 R** **9 Claims**



1. In a circular loom of the type including a machine frame having an upper running ring and a lower running ring, a reed and at least one shuttle arranged therebetween, a rotor driving said shuttle, a harness arranged in a concentric circle about said rotor and adapted for shedding warp threads, and tensioning means provided for said warp threads, the improvement comprising a wave-like extending groove provided in the outer

side of said rotor, catch elements engaging in said groove, flexible means comprising endless loops connected with said catch elements and carrying thread guiding organs arranged at a distance from one another, an upper deflection pulley and a lower deflection pulley for deflecting said endless loops, said upper deflection pulley being located at the height of said upper running ring, said thread guiding organs lying on opposite sides of said upper deflection pulley, and wherein the distance between said upper and said lower running rings as well as the maximum distance between said thread guiding organs on said deflected flexible means are dimensioned such that the shedding angle is sufficiently large so as to prevent a contact of said warp threads with said shuttle.

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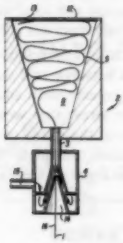
**4,479,518**

## METHOD AND DEVICE FOR FORMING A FILLING-YARN RESERVE FOR LOOMS

**Denis Kiwior, Riedsheim, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse, France**

**Filed Nov. 27, 1981, Ser. No. 325,595**
**Claims priority, application France, Nov. 28, 1980, 80 25710**
**Int. Cl.³ D03D *47/12***
**U.S. Cl. 139—443** **25 Claims**



1. A device for forming a yarn reserve to feed picks to a loom, comprising:

(a) a storage chamber being located between a yarn supply source and a machine for inserting picks into a loom, said storage chamber having an upper part and a perforated lower part, said upper part and said lower part being machined and joined to form a divergent clearance at a first end of said chamber and said upper part and said lower part being machined and joined to form a cavity therebetween;

(b) means for introducing yarn into said storage chamber comprising a compressed-fluid nozzle, said nozzle directing fluid into said storage chamber, said fluid passing through said perforations of said lower part of said storage chamber generating an internal turbulence therein to arrange yarn in juxtaposed substantially regular loops; and

(c) means for retrieving yarn from said storage chamber, said means for introducing yarn into said storage chamber tensioning the yarn upon retrieval.

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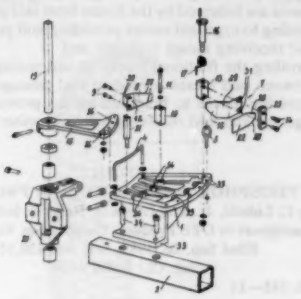
## WEFT BRAKE FOR SHUTTLELESS LOOM

**Albert H. Deborde, and Max Guallo, both of Bourgoin Jallieu, France, assignors to Saurer Diederichs (Societe Anonyme), Bourgoin Jallieu, France**

**Filed Jul. 22, 1982, Ser. No. 400,670**
**Claims priority, application France, Jul. 23, 1981, 81 14793**
**Int. Cl.³ D03D *47/30***
**U.S. Cl. 139—450** **6 Claims**

1. In a loom provided with a supply of weft thread to be transported through a shed of warp threads, guide means defining a transport path for said weft thread, a thread brake in said transport path provided with a stationary jaw and a movable jaw resiliently biased toward said stationary jaw for clamping said weft thread therebetween, and control means intermittently engageable with said movable jaw for separating same from said stationary jaw to unclamp the weft thread engaged thereby,

the improvement wherein said thread brake further comprises a leaf spring interposed between said stationary and



movable jaws for gripping said weft thread between said leaf spring and said stationary jaw in a clamping position of said movable jaw and for engaging said weft thread under reduced pressure in an unclamping position of said movable jaw.

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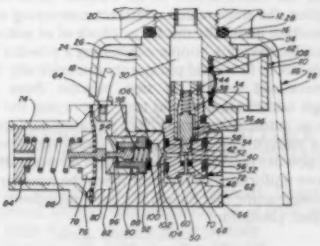
## BALANCED PRESSURE COUPLING

**Clair D. Holben, Denver, Colo., assignor to The Coca-Cola Company, Atlanta, Ga.**

**Continuation of Ser. No. 323,309, Nov. 20, 1981, abandoned.**
**This application Oct. 6, 1983, Ser. No. 539,415**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—1** **12 Claims**



11. A method for transferring pressurized gas from a source of gas under relatively high pressure to a gas pressure regulator having means for receiving said pressurized gas and discharging said pressurized gas at a reduced pressure comprising:

providing a source of gas under relatively high pressure with means for discharging pressurized gas therefrom;

providing a gas pressure regulator with means for receiving said discharged pressurized gas and discharging said received pressurized gas at reduced pressures;

providing means in operative association with said discharge means of said source for providing a passageway for pressurized gas discharged from said discharge means of said source;

assembling said receiving means and said means providing said passageway and engaging said means providing said passageway and said receiving means with sealing means to form a fluid tight space between said means providing said passageway and said receiving means;

discharging pressurized gas from said source and passing

said discharged pressurized gas through said means providing said passageway and said fluid tight space into said receiving means substantially immediately after said fluid tight space has been formed;

distributing the forces from said pressurized gas so that the forces from said pressurized gas tending to separate said means providing said passageway and said receiving means are balanced by the forces from said pressurized gas tending to urge said means providing said passageway and said receiving means together; and

controlling the frictional forces of said sealing engagement between said means providing said passageway and said receiving means to hold said means providing said passageway and said receiving means together.

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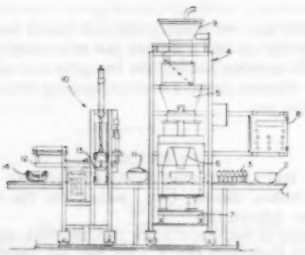
## PHOSPHOR MANUFACTURING PROCESS

**Harvey C. Lubold, Jr., and Glenn H. Roberts, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 20, 1982, Ser. No. 420,144**
**Int. Cl.³ B65B *1/04***
**U.S. Cl. 141—12** **3 Claims**



1. In the manufacture of an alkaline earth halophosphate phosphor, the steps which comprise: conveying an empty tray to a position under the discharge chute of an automatic loader, said loader having a hopper containing a powder blend of raw ingredients to form said phosphor; automatically discharging a predetermined weight of said powder from said hopper through said chute into said tray; conveying the tray of powder to an automatic vibrator; and vibrating said tray of powder with a pattern inserted therein to cause the powder to settle into a powder mass having a thickness throughout that tends to promote uniformity of reaction when the powder mass is fired at a temperature that causes the raw ingredients to react and form said phosphor.

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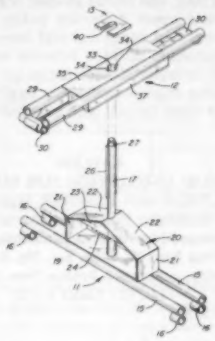
## PORTABLE SAFETY DEVICE FOR INFLATION OF TRUCK TIRES

**Darrell L. Lapham, Akron, Ohio, assignor to GenCorp Inc., Akron, Ohio**

**Filed Aug. 6, 1982, Ser. No. 405,830**
**Int. Cl.³ B60C *25/00***
**U.S. Cl. 157—1** **5 Claims**

1. An improved safety device for restraining a multiple part rim during inflation of the tire on the rim, including a base for supporting the tire and the rim, the base having outwardly extending portions which extend beneath the rim, the base also having a shaft extending perpendicularly to the extending portions for insertion through the center of the rim; and a retainer having a central opening through which the shaft extends, the retainer also having outwardly extending portions which extend over the top of the rim, the rim capable of being restrained between the extending portion of the base and the retainer for absorbing the force of the rim upon explosion of the rim during inflation, wherein the improvement comprises:

said outwardly extending portions of said retainer including relatively stiff arms, outer end support members and central support members depending from said relatively stiff arms at the respective outer end and central portions of said relatively stiff arms, and relatively bendable plates mounted on and extending between said outer end and central support members and spaced beneath said rela-



tively stiff arms, each of said relatively bendable plates having their portions between said outer end and central support members engaga le with said rim and having a yield point below the stress that would normally be exerted upon said plate in the event of an explosion of the rim during tire inflation, the plate thus being bendable inelastically under the force of such an explosion.

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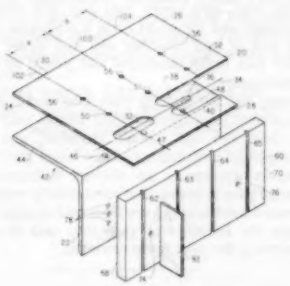
## MORTISE AND TENON JIG

**Dale Peterson, 764 Grant St., and Dean Martin, 3401 Florida Dr., both of Loveland, Colo. 80537**

**Filed Sep. 30, 1982, Ser. No. 428,903**
**Int. Cl.³ B27C *5/10***
**U.S. Cl. 144—144.5 R** **12 Claims**



1. A patterning jig comprising:

a flat template having space-opposed side margins joined by respective front and rear margins;

means defining a first opening through said template spaced inwardly at a predetermined distance from one of said side margins and centered on a line running between said side margins and spaced inwardly from said front margin;

a tongue formed in said template, disposed toward the other of said side margins from said opening and positioned between a pair of means defining open spaces defined through said template, said tongue being centered on said line;

a flat guide projecting downwardly from said template

parallel to and spaced inwardly of said line from said front margin;

said opening having a predetermined width in the direction transverse to said line with said width being selected to receive a router bit guide element and to position the router bit on said line for forming a mortise in a first member located between said opening;

and in which the width of said tongue in said direction is selected for shaping a tenon, matable with said mortise, on a second member located beneath said finger upon receipt of said element successively in said open spaces and engagement of said second member with said bit.

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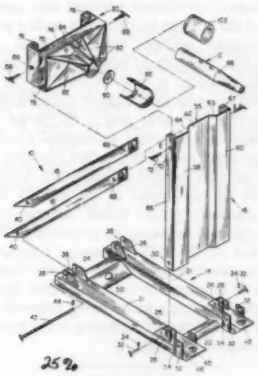
## LOG SPLITTING BLASTING WEDGE AND ANCHOR SYSTEM IMPROVEMENTS

**Albert F. Vosika, Rte. 2, Crete, Nebr. 68333**

**Continuation-in-part of Ser. No. 307,782, Oct. 2, 1981, Pat. No. 4,351,376. This application Sep. 28, 1982, Ser. No. 425,179**
**The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.**
**Int. Cl.³ B27L *7/00***
**U.S. Cl. 144—366** **21 Claims**



1. A method of splitting logs, comprising, providing a blasting wedge and an anchor structure with a

height adjustable wedge receiving sleeve, placing a charge of blasting powder in the wedge, axially driving the wedge into one end of a log to be split

thereby setting the wedge in the log, adjusting the height of the wedge receiving sleeve for

approximate alignment with the set wedge, moving the anchor structure toward the end of the log so that

the wedge is received within the adjusted sleeve, and igniting the charge in the wedge.

21. A method of making firewood, comprising

providing a log to be split, a log blasting wedge and an anchor structure with a height adjustable wedge receiving sleeve,

placing a charge of blasting powder into one end of the wedge,

driving that one end of the wedge into one end of a log,

causing the opposite end of the wedge to be received in the sleeve of the anchor structure,

igniting the charge in the wedge thereby splitting the log into a plurality of split log sections, and

blocking the split log sections.

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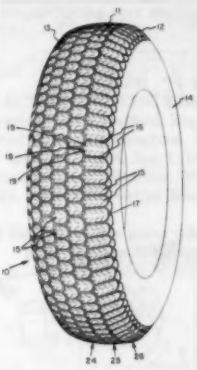
## PNEUMATIC TIRE TREAD

**Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Sep. 14, 1983, Ser. No. 531,981**
**Int. Cl.³ B60C *11/00***
**U.S. Cl. 152—209 R** **13 Claims**



1. A pneumatic tire having a tread portion with a pair of lateral edges, the tread portion consisting of a plurality of independent blocks each having a single plane of symmetry which is directed substantially axially across the tread portion, the blocks each having a respective face thereon directed towards a given one of said edges, all of the respective faces having a generally convex configuration.

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**4,479,526**

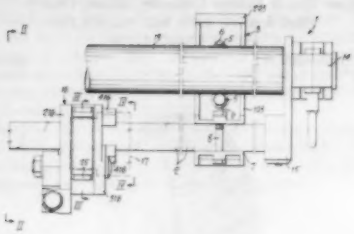
## STRUCTURE WITH ADJUSTABLY-TILTABLE ARTICULATED ARMS FOR WIND UP SUNSHADE TENTS

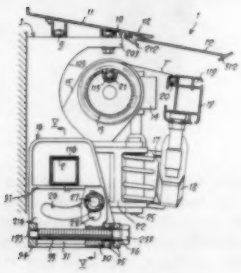
**Rinaldo Rinaldi, Bogliasco; Alberto Ghermignari, Genoa, and Claudio Marcori, Genova Sampierdarena, all of Italy, assignors to Riri Italia S.p.A., Vignole Borbera, Italy**

**Filed Nov. 28, 1983, Ser. No. 555,726**
**Claims priority, application Italy, Nov. 30, 1982, 12680 A/82**
**Int. Cl.³ E04F *10/06***
**U.S. Cl. 160—22** **3 Claims**

1. A projecting structure (1) with adjustably tiltable articulated stretching arms (17, 18), for wind up tents, particularly sunshade tents, comprising a square-shaped attachment bar (2), affixed horizontally to a wall through adjustable brackets (3), a roller (13) for winding up the tent sheet (T), with a respective control winch (14), said roller (13) being supported on said bar (2) parallelly thereto, between end supports (15) keyed and secured to the ends of said bar, said bar (2) having slidably mounted thereon a plurality of square-shaped support and articulation hubs (16), one for each of said stretching arms (17, 18) which stretch the tent sheet (T), characterized in that each of said square-shaped hubs (16) comprises an attachment hinge body (22) which is hinged, on one hand, to said hub (16) co-axially with the square-shaped bar (2) mounted therein and, on the other hand, to the arm (17) which carries the respective stretching arm (17, 18) around an associated pivot (25), adjustment means (26, 27, 29, 30, 33) being provided between the

body of the square-shaped hub (16) and the attachment hinge body (22), to adjust within a pre-established adjustment range





the angular position of said hinge attachment body (22) around the longitudinal axis of said attachment bar (2).

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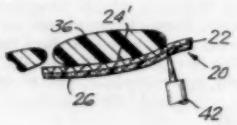
## METHOD FOR FACILITATING THE MANUFACTURE OF A BONDABLE METALLIC SURFACE

**Ralph A. Boettcher, La Verne, Calif., assignor to Unitek Corporation, Monrovia, Calif.**

**Filed Nov. 2, 1982, Ser. No. 438,558**
**Int. Cl.³ B22C 9/04, 7/02**
**U.S. Cl. 164—34** **7 Claims**




1. A method for casting an appliance having a bonding surface which facilitates adhesive bonding thereof, comprising the steps of:

sizing at least one pad to approximate at least a portion of an appliance to be cast, said pad having a surface portion at least partly predeterminedly patterned for producing asperities in a casting surface derived therefrom, and a non-porous backing, said pad being eliminatable at temperatures, employed during lost wax investment casting;

attaching said patterned surface portion with a suitable adhesive to a predetermined surface to be replicated;

fixedly conforming said surface portion to said predetermined surface;

removing said pad from said predetermined surface;

investment casting said pad to form a mold; and

eliminating said pad from the investment casting mold.

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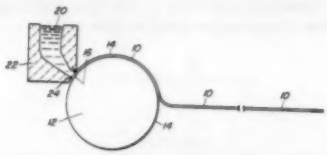
## STRIP CASTING APPARATUS

**Robert E. Maringer, Worthington, Ohio, assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 148,421, May 9, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,587**
**Int. Cl.³ B22D 11/06, 11/10**
**U.S. Cl. 164—423** **21 Claims**




1. An apparatus for continuously casting metal strip comprising:

a tundish for receiving and holding molten metal,

a nozzle comprising at least one separate substantially U-shaped curvilinear element disposed in the tundish and opening into the tundish, said curvilinear element having an elongated orifice passage therein defined between a first side portion and a second side portion of the curvilinear element, the orifice passage extending along the length of the U-shaped curvilinear element and approximating the width of the strip to be cast, said orifice passage having substantially uniform cross-sectional dimensions throughout the longitudinal extent thereof, and

a cooled casting surface at least as wide as the strip to be cast, disposed at a standoff distance of less than 0.120 inch from the nozzle, movable past a discharge end of the orifice passage in a direction substantially perpendicular to the longitudinal axis of the orifice passage,

said first side portion located downstream with respect to the direction of movement of the casting surface and having substantially planar inside surfaces defining the orifice passage, and an outer, lip projecting surface at the discharge end of the orifice passage disposed toward, facing and in complete parallelism with the casting surface for a length of at least 0.01 inch, the outer, lip projecting surface of the first side portion being relieved to define a lip projection at a location beginning at the point of termination of complete parallelism.

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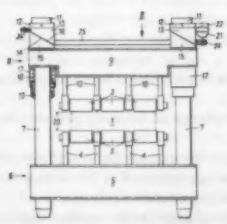
## STRAND GUIDING STAND TO BE USED IN A CONTINUOUS CASTING PLANT

**Werner Scheurecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria**

**Filed Apr. 5, 1982, Ser. No. 365,409**
**Claims priority, application Austria, Apr. 22, 1981, 1812/81**
**Int. Cl.³ B22D 11/12, 11/128**
**U.S. Cl. 164—442** **5 Claims**



1. In a strand guiding stand to be used in a continuous casting

plant, in particular a continuous casting plant for slabs, and of the type including

a fixed stand part and an oppositely arranged displaceable stand part,

drawing anchors connecting said fixed and displaceable stand parts,

strand guiding rollers journaled on said fixed and displaceable stand parts,

a displacement means for displacing, and fixing, said displaceable stand part along said drawing anchors at a desired position opposite said fixed stand part, said displacement means including at least one bushing provided on each of said drawing anchors and having a helical supporting surface, said displaceable stand part being supported on said at least one bushing, and

a fixed abutment provided on each of said drawing anchors for supporting said bushing, the improvement wherein

said drawing anchors each have an end that projects through said displaceable stand part, said bushings being provided only on said drawing anchor ends, and

said helical supporting surface of each bushing has an angle of inclination that is larger than the pertaining angle of friction, the improvement further comprising

means for coupling said bushings for synchronous rotation,

an adjustment drive fixable in different positions and adapted for synchronously rotating said bushings, and

clamping means provided on each of said drawing anchors for constantly urging said displaceable stand part against said bushings.

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**4,479,530**

## METHOD OF MANUFACTURING METALLIC WIRE PRODUCTS BY DIRECT CASTING OF MOLTEN METAL

**Sven T. Ekerot, Box 2751, SE-761 00 Norrtälje, Sweden**

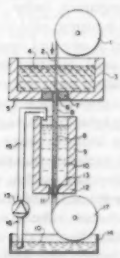
**PCT No. PCT/SE81/00139, § 371 Date Jan. 8, 1982, § 102(e) Date Jan. 8, 1982, PCT Pub. No. WO81/03136, PCT Pub. Date Nov. 12, 1981**

**PCT Filed May 8, 1981, Ser. No. 341,987**

**Claims priority, application Sweden, May 8, 1980, 8003487**

**Int. Cl.³ B22D *19/08***

**U.S. Cl. 164—461** **4 Claims**



1. A method of manufacturing metallic wire products by direct casting of molten metal, in which the molten metal is in the form of a bath contained in a container having an outlet hole in the bottom thereof through which the metal can flow, the method comprising:

A. passing a stabilizing wire out through the container and the outlet hole, the stabilizing wire being of a metal having substantially the same melting point as the molten metal, wherein the diameter of the outlet hole is substantially greater than, and a minimum of 1.5 times greater than the diameter of the stabilizing wire;

B. flowing freely a jet of said molten metal out of said outlet hole;

C. forming an unbroken wire shaped body of said jet that is stabilized by said stabilizing wire;

D. controlling the rate at which the stabilizing wire is passing out through the outlet hole so that it substantially corresponds to the rate at which said jet is flowing out of the outlet hole;

E. cooling the unbroken jet of molten metal surrounding the stabilizing wire and causing it to solidify around the stabilizing wire, substantially all solidification taking place after the stabilizing wire and molten metal have exited from the outlet hole; and

F. collecting the stabilizing wire and solidified surrounding molten metal.

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**4,479,531**

## ELECTROMAGNETIC STIRRING

**Keith R. Whittington, Great Shelford, England, assignor to TI (Group Services) Limited, Birmingham, England**

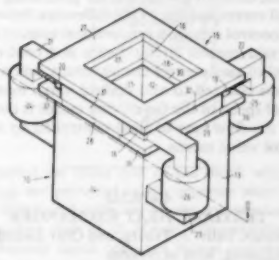
**Continuation of Ser. No. 296,496, Jun. 1, 1981, abandoned. This application Sep. 9, 1983, Ser. No. 530,617**

**Claims priority, application United Kingdom, Jun. 5, 1980, 8018372**

**The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.**

**Int. Cl.³ B22D *27/02***

**U.S. Cl. 164—504** **17 Claims**



1. An apparatus for stirring molten metal in an open topped mold comprising: a series of three or more conductors in the form of closed loops made from bars of non-ferromagnetic electrically conductive material, these loops being positioned around the vertical axis of the mold so that a portion of each loop forms one of a ring of conductive elements surrounding the vertical axis of the mold and positioned above the mold; each of the loops being coupled inductively via an energizing coil to a different phase of a multi-phase alternating current supply, the sequence of the loops being the same as the sequence of the phases, so that currents induced in the loops will produce a magnetic field above the mold, said magnetic field penetrating down into the mold and rotating about the vertical axis of the mold, said energizing coils being located outside the flux path of the magnetic field into the mold; ferromagnetic pole pieces being associated with the loops to provide a low reluctance flux path which will reduce leakage of the magnetic field above the conductors and concentrate the field below the conductors.

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**4,479,532**

## A SYSTEM FOR CONTROLLING A HYDRAULIC COOLING FAN FOR AN ENGINE AS A FUNCTION OF AMBIENT AND COOLANT TEMPERATURES

**Masahiro Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed Dec. 21, 1981, Ser. No. 332,733**

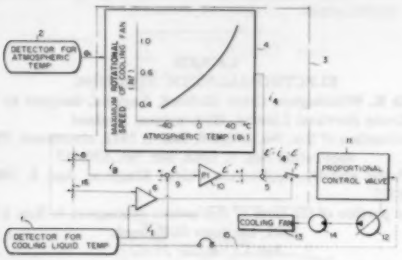
**Claims priority, application Japan, Dec. 25, 1980, 55/185504[U]**

**Int. Cl.³ F28F *27/00***

**U.S. Cl. 165—39** **6 Claims**

1. An automatic actuator system for a cooling fan of an internal combustion engine, said system comprising first detec-

tor means for detecting the temperature of the cooling water in a cooling system for the engine, second detector means for detecting the atmospheric temperature, an electrical control circuit means for generating a first control signal corresponding to the cooling water temperature detected by said first detector means and a second control signal corresponding to the maximum number of revolutions per unit of time of the cooling fan as a function of atmospheric temperature detected


DETECTOR FOR ATMOSPHERIC TEMP
MAXIMUM ROTATIONAL SPEED OF COOLING FAN (R.P.)
ATMOSPHERIC TEMP (°C)
PROPORTIONAL CONTROL VALVE
COOLING FAN
DETECTOR FOR COOLING LIQUID TEMP

by said second detector means, and for generating an electrical output signal corresponding to the difference between the first and second control signals, a proportional control valve means coupled to said control circuit means and controlled by the output signal of said control circuit means, and a cooling fan driving means coupled to said control valve means, wherein the rotational speed of the fan driving means is controlled as a function of the flow rate of fluid controlled by said proportional control valve means.

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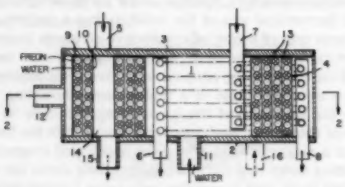
**4,479,533**

## TERTIARY HEAT EXCHANGER

**Ingemar Persson, Tallv. 3, Taberg, and Olov Eklind, Humlegarden 1, Jonkoping, both of Sweden**

**Filed May 27, 1981, Ser. No. 267,537**
**Claims priority, application Sweden, May 27, 1980, 8003940**
**Int. Cl.³ F28D 7/04; F28F 9/22, 9/26**
**U.S. Cl. 165—140** **13 Claims**




1. A tertiary heat exchanger, comprising:
a container including inlet and outlet means;
a first fluid conducted into said container through one of said inlet means;
first conducting means spirally disposed within said container, and forming a passageway extending from said one inlet means outward to one outlet means, for conducting said first fluid out of said container;
second conducting means for conducting a second fluid through said container;
third conducting means for conducting a third fluid through said container;
at least one of said conducting means having a length which is different from the other conducting means;
one of said fluids being heated, and a substantial portion of said second and third conducting means is coiled within said first conducting means so that each of said second and third conducting means comprises a layered stack wherein each turn of the respective coil defines one layer, and heat from the heated fluid is imparted to the remaining fluids by conduction when said fluids are caused to flow through their respective conducting means;
the direction of flow of fluid in said second conducting means is opposite to the direction of flow of fluid in said third conducting means; and
said container further comprises surface means located above and below said second and third conducting means for pressing said second conducting means against said third conducting means throughout their entire lengths to facilitate maximum heat transfer between said conducting means.

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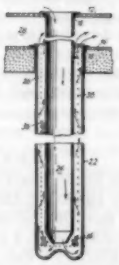
**4,479,534**

## TRANSPARENT RADIATION RECUPERATOR

**Robin B. Rhodes, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.**

**Filed Dec. 7, 1981, Ser. No. 328,054**
**Int. Cl.³ F28D 7/12**
**U.S. Cl. 165—142** **4 Claims**



1. A recuperative heat exchange apparatus for transferring heat from a hot radiating gas to cold gas to be heated comprising:
a. a housing defining a chamber for the flow of the hot radiating gas therethrough;
b. a radiation-transparent outer tube extending into the chamber of said housing, said radiation-transparent outer tube being closed at one end open at the opposite end and comprised of a heat resistant material capable of withstanding temperature in excess of 1600° F.;
c. an outlet header connecting the open end of said radiation-transparent outer tube to a passageway for discharging the gas heated in the heat exchange apparatus;
d. an open ended metallic radiation-absorbing inner tube concentrically disposed within said outer tube so as to define an annular space therebetween and spaced from the closed end of said outer tube so as to permit gas flow from said inner tube into the annular space between said radiation-transparent outer tube and said radiation-absorbing inner tube;
e. an inlet header connecting said inner tube to a supply of cold gas to be heated thereby establishing a continuous flow path for directing cold gas to be heated from said inlet header through said inner tube and thence through the annular space between said inner tube and said outer tube to said outlet header;
f. an apertured tubular radiation-absorbing shield disposed concentrically in the annular space in spaced relationship between said radiation-transparent outer tube and said radiation-absorbing inner tube whereby the gas flowing through the annular passage passes along both sides of and through the apertured tubular radiation-absorbing shield, said apertured shield adapted to absorb a first portion of the radiant heat passing through said radiation-transparent outer tube and transfer the absorbed heat to the gas passing through the annular space while simultaneously per-

mitting a second portion of the radiant heat passing through said radiation-transparent outer tube to pass directly to the radiation-absorbing inner tube.

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**4,479,535**

## RECUPERATIVE RADIANT TUBE

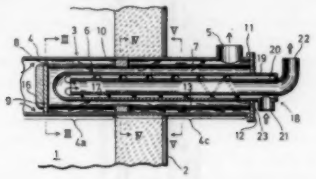
**Ryozo Echigo, 3-17-603, Ecchujima 1-chome, Kohtoh-ku, Tokyo; Takaaki Noda, Aichi; Koichiro Kinto, Mie, and Kenjiro Sato, Aichi, all of Japan, assignors to Daidotokushuko Kabushikikaisha and Ryozo Echigo, both of, Japan**

**Filed Jul. 21, 1982, Ser. No. 400,325**

**Claims priority, application Japan, Jul. 24, 1981, 56-116877**

**Int. Cl.³ F27B *5/14*; F28D *7/12***

**U.S. Cl. 165—142** **4 Claims**



1. A radiant tube comprising a tubular radiator section directly communicating with an inflow section at one end thereof and with an outflow section at the other end thereof so as to provide a continuous inner cylindrical space through the tube so that high-temperture gases are allowed to enter the tube from said inflow section, increase the temperature of said radiator section in order for the same radiator section to radiate heat, and come out from said outflow section, which tube further includes:

(a) a heat exchanger disposed to extend through said outflow section and project into said radiator section to define a cylindrical space thereby over both said outflow section and radiator section;

(b) annular gas impermeable support means disposed at the interface of said radiator section and said outflow section;

(c) a first tubular partition means formed of air-permeable solid matter which is located between said gas impermeable support means and the projecting end of said heat exchanger to enclose said projecting end of said heat exchanger on an upstream side of the gas flow relative to the location of said heat exchanger so that the high-temperature gases having heated said radiator section must pass through said first partition means and come thereinto in order to flow into said outflow section;

(d) removable gas impermeable lid means at the downstream end of said outflow section; and

(e) a second tubular partition means formed of air-permeable solid matter which is located between said lid means and said support means to enclose said portion of said heat exchanger on a downstream side of the gas flow relative to the location of said heat exchanger so that the gases having come into said first partition means must enter and pass through said second partition means in order to come out from the radiant tube.

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**4,479,536**

## HEAT EXCHANGER FOR A GASEOUS AND A LIQUID MEDIUM

**Herman J. Laméris, Hollandse Rading, Netherlands, assignor to Bronswerk K.A.B. B.V., Utrecht, Netherlands**

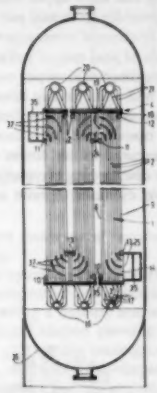
**Filed Aug. 21, 1981, Ser. No. 294,993**

**Claims priority, application Netherlands, Aug. 26, 1980, 8004805**

**Int. Cl.³ F28F *9/22***

**U.S. Cl. 165—145** **11 Claims**

1. A heat exchanger block for transferring heat between a gas and a liquid, which comprises a series of rows of parallel, closely spaced tubes and two further rows of parallel, closely spaced tubes at the opposite sides of said series of rows and orthogonal thereto, filler means joining the tubes of the end rows of said series of rows and the tubes of said two further rows to provide gas impervious walls surrounding the remainder of said series of rows, the tubes of said two further rows being of less length than the tubes of said series of rows and the ends of the tubes forming one of said further rows being disposed closely adjacent one end of the block which the ends of the tubes forming the other of said further rows being disposed



closely adjacent the other end of the block whereby lateral wall openings are provided at the opposite sides and ends of said block, first liquid collector means communicating one set of corresponding ends of all of said tubes exteriorally of said block and second liquid collector means communicating the other set of corresponding ends of all of said tubes exteriorally of said block, means for introducing gas into one of said lateral openings and means for collecting gas from the other of said lateral openings, and means for introducing liquid into said first liquid collector means while educting liquid through said second collector means.

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**4,479,537**

## POWER TUBING HANGER AND TUBING STRING LIFTING ASSEMBLY

**Lehman T. Reed, Bakersfield, Calif., assignor to Midway Fishing Tool Co., Long Beach, Calif.**

**Filed Sep. 26, 1983, Ser. No. 535,684**

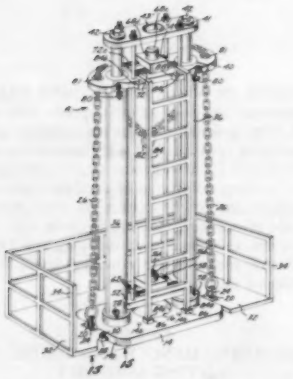
**Int. Cl.³ E21B *19/00***

**U.S. Cl. 166—77** **9 Claims**

1. In combination with a producing oil well that has a well head that removably supports an array of valves that are in communication with a vertical off centered passage in a well hanger from which a tubing string extends downwardly in an off centered position in said well to a downhole pump that is driven by an electric motor that is supplied electric power through a cable that extends upwardly in said well to a connector that removably engages an off centered vertical electrical conductor supported by said tubing hanger and said conductor having an upper end that by a connector is connected to a source of electric power, said passage in said tubing hanger having an upper threaded end, a portable apparatus for elevating said tubing hanger to a position above said well head where said connectors may be replaced by a user after said tubing string has had a plug removably positioned therein, said array of valves has been removed from said well head and replaced by a power operated blow out preventer that has an upper surface, said blow out preventer when in an open position defining a vertically extending space of sufficient transverse cross section as to permit said tubing hanger and a portion of

said tubing string situated therebelow to be moved upwardly and downwardly therethrough and said blow out preventer when in a closed position and said tubing hanger situated thereabove sealingly gripping said tubing string when the latter is centered therein to maintain control of said well, said portable apparatus comprising:

a. a power operated assembly that includes a horizontal base having a transverse opening therein of greater diameter than said tubing hanger; a pair of parallel hydraulic cylinders that extend upwardly from said base on opposite sides of said opening and have upper ends; a pair of piston rods that extend upwardly from said pair of cylinders and have upper ends, a horizontal cross piece that extends between said upper ends of said pair of cylinders; a lifting member that extends between said upper ends of said piston rods; a plurality of pull rods having lower ends, said pull rods depending from said lifting member and slidably movable in transverse openings in said cross piece; a horizontal pulling plate secured to said lower ends of said pull rods; first means for discharging pressurized hydraulic fluid into and out of said cylinder to raise and lower said pulling plate;



b. threaded pulling sub means that removably engage said threaded end of said passage in said tubing hanger and are rotatably supported from said pulling plate, said pulling sub means and pulling plate moving said tubing hanger and a portion of said tubing string upwardly through said opening in said base when hydraulic fluid is discharged into said cylinders and said blow out preventer is in an open position with said tubing string in an off centered position therein;

c. second means on said assembly for moving said well head and tubing string laterally relative to well bore to a position when said tubing string is centered in said blow out preventer to permit the latter to be actuated to assume a closed position to maintain control of said oil well;

d. third means that occupy a fixed elevation on said assembly for preventing inadvertent downward movement of said tubing hanger and tubing string during the time said connectors are being replaced; and

e. fourth means for removably maintaining said base at a fixed vertical position relative to said blow out preventer.

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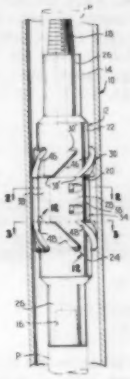
**4,479,538**

## CASING SCRAPER AND METHOD FOR MAKING THE SAME

**William E. Coyle, Sr., Houma, La., assignor to Bilco Tools, Inc., Houma, La.**

**Filed Jun. 22, 1981, Ser. No. 275,790**
**Int. Cl.³ E21B *37/02***
**U.S. Cl. 166—173** **6 Claims**



1. In a well scraping tool including a unitary generally cylindrical body having two sets of slots therein and an outwardly biased cutter blade within each of said slots, the improvement wherein:

each of said slots is undercut along its length; said improvement further comprising

a longitudinal flange on each blade, said flange extending laterally from one side of said blade for the length thereof, said flange engaging a respective one of said undercuts to retain the blade within the body;

said body having a circumferential groove between said slots and intersecting an adjacent end of each slot, said groove extending completely around said body and having sufficient width and depth to allow for lengthwise insertion and removal of said blades from their respective slots; and

a locking ring removably secured within said groove to prevent lengthwise movement of the blades within their grooves.

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**4,479,539**

## DOWNHOLE LOCK SYSTEM

**Jack W. Tamplen, Celina, and Carter R. Young, Argyle, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.**

**Filed Oct. 18, 1982, Ser. No. 434,723**
**Int. Cl.³ E21B *23/04***
**U.S. Cl. 166—212** **18 Claims**

1. A locking mandrel for releasably securing a flow conductor device at a downhole location within a well flow conductor, comprising:

a. a tubular housing means with a longitudinal passage extending therethrough;

b. a plurality of windows extending radially through the housing means intermediate the ends thereof;

c. a locking dog disposed within each window and radially slidable relative to the housing means;

d. an expander sleeve slidably disposed within the longitudinal passageway adjacent to the locking dogs;

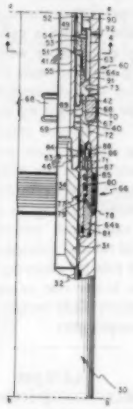
e. the expander sleeve having three positions, the first position allowing retraction of the dogs within the windows, the second position projecting a portion of each dog radially from its respective window, and the third position allowing retraction of each dog within its window;

f. piston means slidably disposed within the longitudinal

passageway and operatively engaging the expander sleeve;

g. means for communicating fluid pressure to the piston means whereby the piston means can shift the expander sleeve from its first to its second position;

h. means for releasably securing the expander sleeve in its first position until the fluid pressure applied to the piston means exceeds a preselected value;



i. a profile formed on the interior of the expander sleeve which can be mechanically engaged by a well tool to move the expander sleeve from its second to its third position; and

j. means for removing the locking mandrel from its downhole location after the expander sleeve has been shifted to its third position.

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**4,479,540**

**GASIFICATION OF COAL**

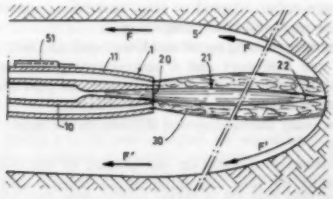
**Maurice Grenier, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France**

**Filed May 24, 1982, Ser. No. 381,623**

**Claims priority, application France, Jun. 5, 1981, 81 11149**

**Int. Cl.³ E21B *43/243;* E21C *43/00***

**U.S. Cl. 166—260** **9 Claims**



1. A process for the underground gasification of coal, comprising drilling a blind bore extending to a coal seam, said bore having a peripheral wall and an end wall, ejecting within said coal seam and toward said end wall a central gaseous jet of a gasifying agent and a peripheral substantially annular jet of a separating fluid, said substantially annular jet being ejected substantially parallel to and around and in the same direction as said central jet so as to form an annular sheet of said separating fluid around said central jet, and extracting from said bore a fuel gas resulting from an incomplete combustion of said coal, said fuel gas flowing from said bore end wall between said bore peripheral wall and said annular sheet.

**4,479,541**

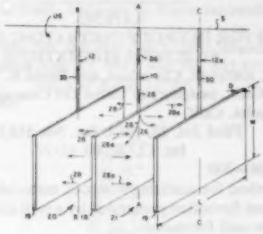
**METHOD AND APPARATUS FOR RECOVERY OF OIL, GAS AND MINERAL DEPOSITS BY PANEL OPENING**

**Fun-Den Wang, c/o Elektra Energy Corp., 340 N. Belt E., Houston, Tex. 77060**

**Filed Aug. 23, 1982, Ser. No. 410,391**

**Int. Cl.³ E21B *43/16***

**U.S. Cl. 166—268** **16 Claims**



1. Method for oil, gas and mineral recovery by panel opening drilling comprising:

(a) providing spaced apart injection and recovery drill holes extending along respective longitudinal axes into an underground area having a deposit bearing region,

(b) drilling a first panel shaped opening outwardly of the injection hole by cutting the underground area adjacent the injection hole, said first panel shaped opening substantially facing the deposit bearing region, and

(c) injecting said injection hole with a fluid under sufficient pressure to uniformly sweep the deposits in the underground area to said recovery hole for recovery of the deposits therefrom.

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**4,479,542**

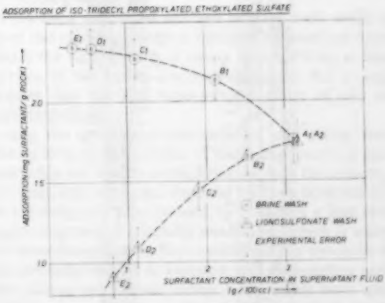
**ENHANCED OIL RECOVERY PROCESS UTILIZING A LIGNOSULFONATE AS A SOLUBILIZING AGENT IN AN AFTERFLUSH**

**Mark P. Warchol, and Walter W. Gale, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.**

**Filed Nov. 22, 1982, Ser. No. 443,261**

**Int. Cl.³ E21B *43/22***

**U.S. Cl. 166—273** **12 Claims**




7. A method for recovering crude oil from a subterranean formation penetrated by an injection well and a production well, which comprises:

(a) injecting into said formation via said injection well a surfactant-containing liquid for displacing said crude oil, said surfactant-containing liquid being substantially free of lignosulfonate salts;

(b) subsequently injecting an aqueous solution containing

lignosulfonate salts, said aqueous solution being substantially free of surfactant and said lignosulfonate salts being present in an amount sufficient to reduce the retention of surfactant by said formation;

(c) injecting flooding water to drive said surfactant-containing liquid, aqueous solution, and crude oil through said formation to said production well, said flooding water being substantially free of surfactant; and

(d) recovering said crude oil via said production well.

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**4,479,543**

## METHOD FOR DEEPER PENETRATING ACIDIZING OF SILICEOUS FORMATIONS

**Leonard J. Kalfayan, Claremont, and David R. Watkins, Irvine, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Filed Jul. 28, 1983, Ser. No. 518,097**
**Int. Cl.³ E21B *43/27***
**U.S. Cl. 166—300** **30 Claims**

1. A method for acidizing siliceous materials contained in a subterranean formation penetrated by a well comprising injecting into the said formation:

(a) first a slug of an organosilane or an ester of an organosilane, and

(b) next a slug of an aqueous acidizing composition comprising a mixture of

(1) a first acidizing component selected from the group consisting of non-oxidizing mineral acids, acid precursors, low molecular weight organic acids, and halogenated derivatives of low molecular weight organic acids, and

(2) a second acidizing component selected from the group consisting of fluorine-containing acids and fluorine-containing salts.

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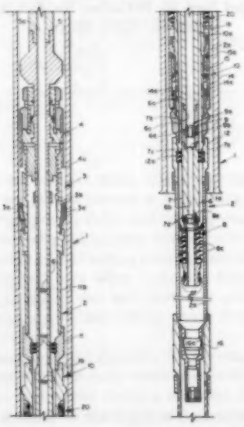
**4,479,544**

## PRESSURE ACTUATED PACK-OFF AND METHOD

**Rudy B. Callihan; Bobby F. Goad, and Gary A. Miller, all of San Antonio, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.**

**Filed Mar. 2, 1983, Ser. No. 471,399**
**Int. Cl.³ E21B *33/13***
**U.S. Cl. 166—290** **21 Claims**



1. Apparatus for sealing the casing annulus defined between the bore of a well casing and a hanger supported liner subsequent to a cementing operation comprising, in combination: a tubular seal mounting assembly connectable between the liner hanger and the upper portion of the liner above the cementing zone; said tubular assembly comprising:

(1) an annular pack-off unit radially expandable into sealing engagement with said casing annulus in response to an applied axial compressive force;

(2) a pair of vertically spaced, internally projecting, annular seals;

(3) an annular fluid pressure chamber having a fluid supply port intermediate said annular seals; and

(4) an annular piston movable within said fluid pressure chamber to exert an axial compression force on said pack-off unit to seal said annulus;

a tubular extension extending through said tubular assembly; said tubular extension having a cylindrical external surface selectively sealingly engageable with either or both of said internally projecting annular seals by vertical movement of said tubular extension, whereby cementing fluid may be passed through said tubular assembly by engaging said cylindrical external surface of the tubular extension with both of said internally projecting annular seals; means defining an annular valve seat in the liner below the lower one of said internally projecting annular seals; and a plug type valve element insertable through said tubular extension into seating engagement with said annular valve seat; whereby application of fluid pressure through said tubular extension subsequent to cementing and raising said tubular extension out of sealing engagement with only the lower one of said internally projecting annular seals will supply fluid pressure to said annular piston through said fluid supply port.

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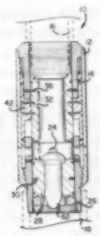
**4,479,545**

## WELL-CEMENTING STAGE COLLAR

**Fred N. Eley, Rte. 1, Box 182B, Gaston, Oreg. 97119**

**Filed Oct. 27, 1982, Ser. No. 437,152**
**Int. Cl.³ E21B *33/13***
**U.S. Cl. 166—318** **9 Claims**



1. A stage collar adapted to form part of a conduit string positionable in a well bore comprising

a tubular body having upper and lower ends and including at least one side port and a corresponding side aperture disposed longitudinally above the port, the port and aperture each having inner and outer openings,

an upper inner sleeve disposed slidably on the inside of said body,

a gate disposed slidably on the outside of the body and extending partially circumferentially around said body, and

a neck extending slidably through the aperture fixedly joining said upper inner sleeve to said gate,

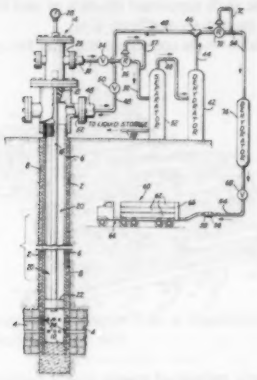
said aperture, gate, upper inner sleeve and neck being constructed relative to the port in such a manner that said upper inner sleeve and gate are shiftable, selectively and simultaneously, from an initial position in which both said upper inner sleeve and gate close the inner and outer openings of the aperture, respectively, and are unobstructive substantially of the port, to a second position in which both said upper inner sleeve and gate cover, concurrently and substantially completely, the inner and outer openings, respectively, of the aperture and port.

4,479,546

## METHOD AND APPARATUS FOR PRODUCING NATURAL GAS FROM TIGHT FORMATIONS

Don A. Bresie; Jack M. Burns, and Donald W. Fowler, all of 5407 N. IH 35 Suite 304, Austin, Tex. 78723

Filed Jan. 28, 1983, Ser. No. 461,991
Int. Cl.³ E21B *43/12, 43/34*
U.S. Cl. 166—369 18 Claims



1. The method for producing natural gas from a preselected number of gas wells located in a tight formation producing area, including the steps of:

equipping each of said wells with piping means designed and arranged to define a sealed reservoir for receiving and accumulating natural gas produced from said tight formation area over a lapse of time, the piping means for each of said wells including an inner production tubing having a casing tubing placed thereabout in annular spaced relationship, the upper and lower ends of the annular chamber formed between said production tubing and said casing tubing being closed and said annular chamber forming at least part of said sealed reservoir, the annular chamber being connected with said production tubing by conduit means having a flow control valve therein operable to control natural gas flow into said chamber, and the upper end of said piping means being fitted with connector means communicating with said annular chamber and adapted for detachably connecting said reservoir with mobile pressure vessel means;

calculating for each of said wells the rate of natural gas flow from said tight formation area into said reservoir, the holding capacity of said reservoir, and the time lapse required to accumulate a batch of natural gas within said reservoir having a volume chosen to assure optimum well production;

calculating the number of mobile pressure vessel means required to assure collection of each optimum batch volume in a timely manner;

establishing a collection schedule for servicing each of said wells, designed to remove optimum batch volumes of natural gas from the reservoir thereof in a timely manner;

opening said flow control valves to produce said natural gas wells and cause the accumulation of natural gas within said reservoirs in accordance with said well calculations;

moving a mobile pressure vessel means to each well in accordance with said collection schedule, temporarily connecting it to the well's reservoir with said connector means, and transferring said optimum batch volume of natural gas to said pressure vessel means;

moving all of said pressure vessel means to an off-loading facility periodically in accordance with said collection schedule, and substantially emptying said pressure vessel means at said facility; and

repeatedly moving said mobile pressure vessel means between said gas wells and said off-loading facility in accordance with said collection schedule and with said flow control valves operated to produce said wells, to effect optimum continuous natural gas production from said tight formation producing areas.

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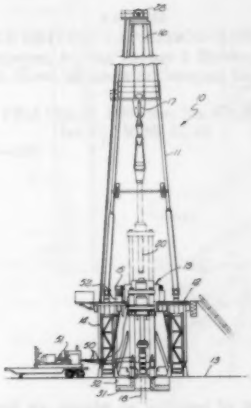
4,479,547

## WELL PIPE JACK

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Continuation of Ser. No. 268,763, Jun. 1, 1981, abandoned. This application Aug. 11, 1983, Ser. No. 522,547
Int. Cl.³ E21B *19/10*
U.S. Cl. 166—383 9 Claims



1. The method that comprises:

drilling a well utilizing a rig having a mast and a rig floor in predetermined drilling positions in which the mast projects upwardly above the well and the rig floor extends generally horizontally near the lower end of the mast, and utilizing a drill string suspended by said mast and extending downwardly along a predetermined axis relative to said mast and through said rig floor and into the well;

removing said drill string from the rig after completion of the drilling operation;

then lowering along said axis and into the well, while said mast and rig floor remain in said drilling positions thereof above the well, a string of casing which, during at least a portion of the casing lowering operation, has a weight greater than the load supporting capacity of said mast used in drilling;

effecting the downward movement of said casing string, during at least said portion of the casing lowering operation when the weight of the string exceeds the capacity of the mast, and while said mast and rig floor both remain in said drilling positions thereof, by actuating a first casing supporting unit of a jacking mechanism which is accessible from above said rig floor used in drilling upwardly and downwardly relative to a second casing supporting unit of the jacking mechanism which is accessible from above said rig floor by means of a plurality of fluid pressure operated piston and cylinder mechanisms projecting downwardly beneath the level of said rig floor, with the casing string being supported alternately by the two units respectively;

transmitting load forces resulting from the weight of said casing string from each of said supporting units downwardly through said piston and cylinder mechanisms to a location spaced beneath said rig floor and to the earth at

that location without transmission of said forces through said mast, but while said mast and rig floor used in drilling remain in said drilling positions thereof above the well; and

suspending additional sections of casing from said mast as they are added to said casing string.

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**4,479,548**

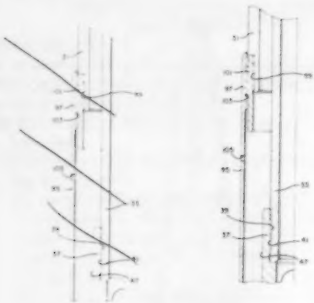
## SETTING TOOL ADAPTER KIT

**Bruce Gilbert, Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.**

**Filed Mar. 17, 1983, Ser. No. 476,442**

**Int. Cl.³ E21B *23/06***

**U.S. Cl. 166—387** **5 Claims**



**1.** A method of installing an adapter kit for attaching a wireline setting tool of the type having a power actuated outer sleeve and a cooperating inner tubular member to a well packer, comprising the steps of:

providing a tubular mandrel having an upper end with upper connecting means adapted to engage mating connecting means on said setting tool inner tubular member, an exterior, and a ramp area formed in a portion of said exterior;

forming a collet with a ring-shaped collet body and a plurality of externally threaded collet fingers, said fingers being expandable outwardly from a normally collapsed position of a lesser relative diameter to an expanded position of greater relative diameter;

sliding said collet over said tubular mandrel so that said collet fingers are forced over said ramp area to forceably expand said fingers to a preselected diameter, whereby said collet finger external threads are engagable with a mating surface of said packer;

releasably connecting said collet to said mandrel exterior with said collet fingers in said expanded position; and

engaging said threaded collet fingers with a mating surface of said packer by rotating said collet about said tubular mandrel while holding said packer stationary.

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**4,479,549**

## GROUND WORKING IMPLEMENT

**Richard L. Fegley, Ohio City, Ohio, assignor to Remlinger Manufacturing Co., Inc., Kalida, Ohio**

**Filed Aug. 1, 1983, Ser. No. 518,985**

**Int. Cl.³ A01B *63/22, 63/32***

**U.S. Cl. 172—142** **8 Claims**

**1.** A ground working implement comprising:

three first rectangular frames, each of which is connected at its rear side to a rotatable packer wheel extending substantially the entire length of said rear side of said first frame;

each of two of said first frames being connected on one of their sides by hinges to the remaining said first frame;

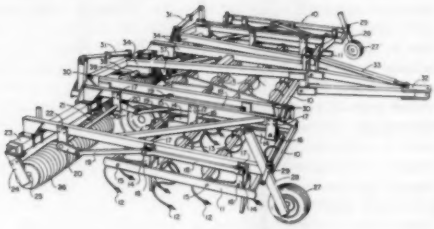
each of said first frames being provided with a second frame connected thereto by a plurality of bell cranks forward of said packer wheel;

downwardly extending tines attached to said second frame;

said bell cranks being connected to a first lever arm which in turn is connected to a second lever arm;

a rotatable shaft supported on each of said first frames connected to said second lever arm;

said rotatable shafts connected together for concurrent rotation;



a selectively reciprocal power source connected to a third lever arm which in turn is connected to said shaft on said remaining first frame;

ground support means connected to said shaft on said remaining first frame;

a hitch extending from the end of said remaining first frame opposite to the rear side supporting said packer wheel and adapted to be attached to a traction device; and

means for rotating said two first frames so that they will be supported on the said remaining first frame for road transport.

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**4,479,550**

## SUBMERGING RAMMING ARRANGEMENT

**Hans Kühn, Hamburg, and Jochen Rüsen, Ellerau, both of Fed. Rep. of Germany, assignors to Koehring GmbH, Hamburg, Fed. Rep. of Germany**

**Filed Dec. 14, 1981, Ser. No. 330,769**

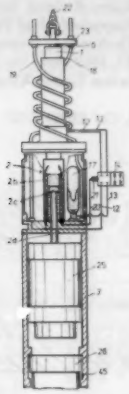
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047375**

**Int. Cl.³ B23B *45/16;* B23Q *5/027***

**U.S. Cl. 173—112** **29 Claims**

**1.** A submergible ramming arrangement adapted to be suspended on a supporting element, comprising a housing having an axis which is substantially upright in a working position, and an upper portion; an impacting body axially displaceable in said housing for delivering ramming impacts; hydraulic drive means including a first hydraulic cylinder-and-piston unit for displacing said impacting body, and a second hydraulic cylinder-and-piston unit arranged in said upper portion of said housing for adjusting displacement of the ramming device relative to the supporting element and having a cylinder with a longitudinal axis extending in direction of the displacement of said impacting body; a piston sealingly displaceable in said cylinder and subdividing the same into a first chamber farther from said impacting body and a second chamber closer to the latter, a piston rod connected with said piston and having a portion extending coaxially outwardly beyond said cylinder; holding means for mounting the arrangement on a supporting element, said holding means being provided on said on said outwardly extending portion of said piston, a hydraulic accumulator communicating with said first chamber of said second cylinder-and-piston unit and arranged for receiving excess

hydraulic medium under pressure; and indicating means actuated by said piston of said second cylinder-and-piston unit



within a predetermind distance from a respective end of said second cylinder-and-piston unit.

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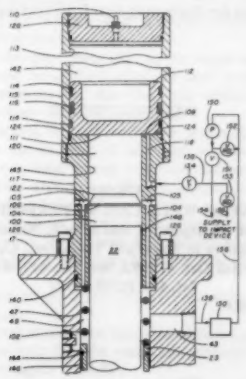
**4,479,551**

## ACTUATOR FOR A HYDRAULIC IMPACT DEVICE

**Edgar J. Justus, Beloit, Wis., assignor to Hughes Tool Company, Houston, Tex.**

**Filed Nov. 27, 1981, Ser. No. 325,319**
**Int. Cl.³ B25D *9/00***
**U.S. Cl. 173—119** **6 Claims**



**1.** In an actuator for providing a sudden work stroke to an impact device which includes a hammer housing member, a ram slidably disposed in the hammer housing member for reciprocal movement therein, means for moving the ram upwardly in the hammer housing member, and means for releasing the means for moving the ram upwardly, the actuator including a hydraulic housing member for receiving at least one end of the ram, a piston housing in fluid communication with the hydraulic housing member, means within the piston housing for receiving potential energy therein, a piston face disposed within the piston housing and defining, together with the opposed face of the ram and the walls of the hydraulic housing member and piston housing, a hydraulic chamber for receiving liquid therein, wherein the improvement comprises:

a portion of the piston face and an upper portion of the hydraulic housing define an interface therebetween when the piston face is at its lowermost extension in the piston housing;

means for maintaining liquid at the interface to snub movement of the piston face toward the hydraulic housing;

opening means in the hydraulic housing, and associated with the ram, such that the openings remain sealed by the ram to thereby seal a finite quantity of liquid received in the hydraulic chamber and maintain a space between the piston face and ram, said liquid remaining sealed until at or about the time the release of potential energy has moved the piston face to its proximate interface position on its power stroke and the pressure thereby produced in the liquid has moved the ram to a corresponding lower position to essentially complete its power stroke, at which time the ram unseals the opening means to release the liquid pressure.

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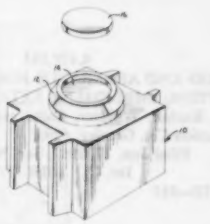
**4,479,552**

## PILE DRIVING CAP BLOCK CUSHION

**Cecil C. Chappelow, Jr., and Thomas J. Byerley, both of Johnson County, Kans., assignors to Conmaco, Inc., Kansas City, Kans.**

**Filed Mar. 8, 1983, Ser. No. 473,255**
**Int. Cl.³ B23B *45/16***
**U.S. Cl. 173—139** **5 Claims**



**1.** A pile driving assembly comprising:

a helmet adapted to be placed in overlying relationship to the pile being driven,

said helmet having a cone portion for receiving a cushion material;

a glass fiber reinforced thermoplastic material disposed in said cone portion and characterized by a melting point of at least 125° C., a secant modulus of elasticity of from 50,000 p.s.i. to 800,000 p.s.i. and a coefficient of restitution of from 0.4 to 0.9,

said thermoplastic material undergoing partial deformation during a pile driving operation to form an encapulated liquid center within said helmet,

whereby pile driving forces are transmitted through said thermoplastic material while some shock forces are absorbed by said material.

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**4,479,553**

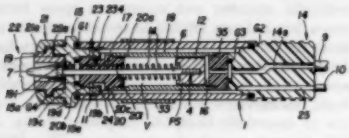
## PNEUMATICALLY ACTUATED AND CONTROLLED DEVICE FOR CARRYING OUT OPERATIONS ON ELECTRONIC COMPONENTS

**Tonino Virgili, Via Molino, 8, Montefiore dell'Aso (AP), Italy**

**Filed Feb. 17, 1982, Ser. No. 349,586**
**Claims priority, application Italy, Mar. 17, 1981, 3372 A/81**
**Int. Cl.³ B23B *45/04***
**U.S. Cl. 173—168** **13 Claims**

**1.** A device for carrying out operations on electronic components, comprising a handgrip, a tool-holder mounted on said handgrip, said tool-holder being adapted for holding pincer type tools having a pair of limbs, a cylinder-piston assembly mounted in said handgrip and operated by a source of compressed air, a rod mounted in said handgrip and operatively associated with said assembly and having a conical head pro-

vided to come into contact with a pair of levers connected to said limbs so as to occasion their closing and their subsequent re-opening with the return to the original position of said conical head, said device being characterized by the fact that, in parallel with the supply of compressed air to said cylinder-



piston assembly, it is provided with a bypass duct that communicates, in the region of the handgrip of the tool, with an aperture communicating freely with the outside, said limbs being alternately closed and opened when said aperture is obstructed.

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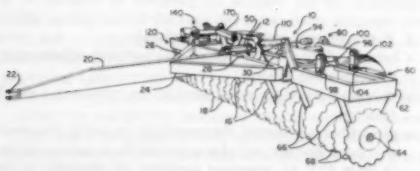
**4,479,554**

## METHOD AND APPARATUS FOR MOUNTING AND LIFTING IMPLEMENT EXTENSION WINGS

**Darrel D. Kueker, Windsor, Colo., assignor to J. B. McCoy Construction Co., Greeley, Colo.**

**Filed Jun. 17, 1982, Ser. No. 389,452**
**Int. Cl.³ A01B *73/00***
**U.S. Cl. 172—311** **8 Claims**



2. In agricultural and horticultural implement apparatus that have a main section of tools adapted to work a width of ground and extension wing apparatus of additional tools for increasing the effective width of ground that can be worked by the implement, the improvement comprising:

a wing bracket member extending from said extension wing apparatus toward said main section, said wing bracket member having an elongated slotted hole in the distal end thereof, which is substantially vertical when said extension wing apparatus is extended outwardly in the same horizontal plane as said main section;

a shaft attached to said main section, said shaft being oriented with its longitudinal axis congruent with said horizontal axis about which said extension wing is pivoted and extending through said slotted hole in said wing bracket member;

an elongated lift arm, one end of which is pivotally mounted on said shaft and the distal end of which extends outwardly over said extension wing apparatus, said distal end of said lift arm being connected to said extension wing apparatus a spaced distance outwardly from said shaft, and

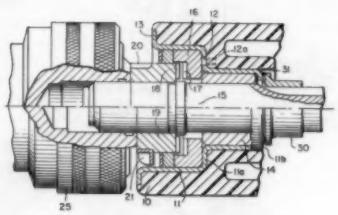
reversible hydraulic motion producing means connected to said lift arm for pivoting said lift arm about said shaft.

**4,479,555**

## POWER TOOL HAVING A PLASTICS MATERIAL HOUSING

**Horst Grossmann, Huenfelden-Kirberg; Rolf Meier, Funkel, and Karl Schmid, Idstein-Woersdorf, all of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.**

**Filed Nov. 12, 1982, Ser. No. 441,224**
**Claims priority, application United Kingdom, Nov. 13, 1981, 8134219**
**Int. Cl.³ E02D *7/02***
**U.S. Cl. 173—171** **13 Claims**



1. A power tool, comprising:

a plastics material housing;

a power output spindle;

a tube-like metal member integrally moulded in the front end of said housing;

a bearing received within said tube-like member and supporting said spindle; and

said tube-like member having at the front end thereof a plurality of radially outwardly extending tabs at least partially embedded in the plastics material of the front end of said housing for anchoring said tube-like member therein and for dissipating heat from said member and said bearing.

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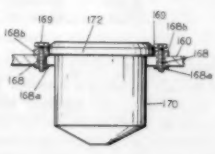
**4,479,556**

## SUBTERRANEAN WELL CASING PERFORATING GUN

**Gregg W. Stout, Montgomery, and John A. Nelson, Spring, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.**

**Filed Oct. 4, 1982, Ser. No. 432,481**
**Int. Cl.³ E21B *43/11***
**U.S. Cl. 175—4.6** **12 Claims**



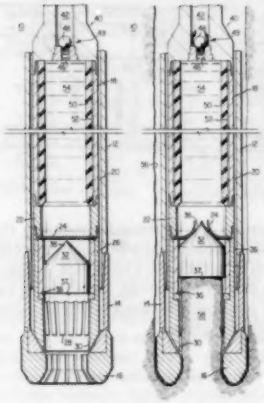
8. A subterranean well perforating apparatus, comprising: a hollow, axially symmetrical housing having a side wall; said side wall of said housing having at least one radially disposed hole therein; an explosive charge container having a body inserted in said hole; radially projecting flange means on said body limiting the insertion of said container into said hole; and fastening means operable from the exterior of said housing for clamping said flange means against said housing side wall.

4,479,557

## METHOD AND APPARATUS FOR REDUCING FIELD FILTER CAKE ON SPONGE CORES

Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Co., Midland, Tex.

Filed Jul. 13, 1983, Ser. No. 513,267
Int. Cl.[3] E21B *25/06, 25/10*
U.S. Cl. 175—59 34 Claims



1. A well core drilling apparatus for recovery of subterranean fluid, comprising:

means for boring a well core containing subterranean fluid;

container means associated with said boring means for containing said well core;

sealing means for sealing said container means from the external environment;

an absorbant member disposed on the inner walls of said container and positioned adjacent said well core, said absorbant member for absorbing the subterranean fluid that bleeds from said well core; and

means for breaking the seal formed by said sealing means in response to the forming of said core such that said core enters said container means relatively unobstructed.

18. A method for drilling a well core and recovering subterranean fluids disposed therein, comprising:

disposing an absorbant material in the inner barrel of a well coring apparatus for absorbing the subterranean fluid that is contained in the well core for later retrieval and analysis;

sealing the inner barrel from the external environment of the well core; and

breaking the seal of the inner barrel in response to forming of the well core such that the absorbant material is protected until the well core is formed.

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4,479,558

## DRILLING SUB

Elbert R. Gill, Meeker, Colo., and Ladd M. Adams, Norman, Okla., assignors to Gill Industries, Inc., Meeker, Colo.

Filed Aug. 5, 1981, Ser. No. 290,296
Int. Cl.[3] E21B *17/18*
U.S. Cl. 175—320 12 Claims

1. A drilling apparatus, comprising:

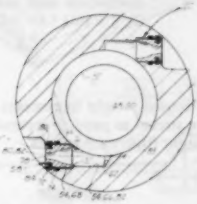
a cylindrical housing having an upper end adapted to be connected to a drill string and a lower end adapted to be connected to a drill bit;

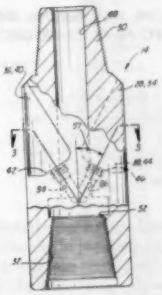
an open cavity disposed in an outer cylindrical surface of said housing;

a longitudinal passageway disposed through said housing;

a transverse passageway means, disposed in said housing and having a first end substantially tangentially intersecting said longitudinal passageway for taking a portion of drilling fluid from said longitudinal passageway, and having a second end communicated with said open cavity for ejecting said portion of drilling fluid from said second end of said transverse passageway means with a non-radial velocity component in a plane normal to a longitudingal axis of said housing;

wherein said housing has a straight cylindrical transverse opening disposed therein with a first end of said transverse opening substantially tangentially intersecting said longitudinal passageway and with a second end of said trans-





verse opening communicated with said open cavity, and wherein a longitudinal axis of said straight cylindrical transverse opening tangentially intersects and inner cylindrical surface of said longitudinal passageway; and

wherein said drilling apparatus further includes a nozzle disposed in said transverse opening, said nozzle having an inlet and a restricted outlet and having at least a portion of said transverse passageway means disposed therethrough connecting said inlet and restricted outlet, an inner diameter of said restricted outlet being smaller than an inner diameter of said inlet.

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4,479,559

## METHOD AND APPARATUS FOR WEIGHING MATERIAL

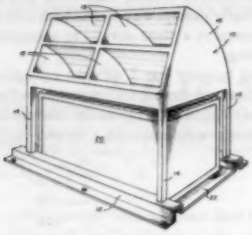
R. Langdon Wales, Moccasin Hill, Lincoln, Mass. 01773, and H. W. Crowley, 310 Parker, Newton, Mass. 02159

Filed Jan. 21, 1983, Ser. No. 459,777
Int. Cl.[3] G01G *19/22, 19/00*; B67D *5/08*
U.S. Cl. 177—1 24 Claims

16. A method of weighing material from multiple streams with a common scale, comprising;

delivering a quantity of said material that is to be weighed from each respective stream,

sensing increments in scale weight from each respective delivery,



and adding sensed weight increments associated with each respective stream to provide separate counts corresponding to weight from each stream.

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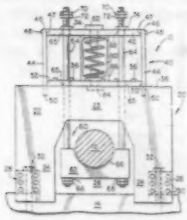
**4,479,560**

## PORTABLE PALLET WEIGHING APPARATUS

**Richard M. Day, Severna Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Aug. 19, 1982, Ser. No. 409,680**
**Int. Cl.³ G01G *19/14, 21/08;* G01N *3/00***
**U.S. Cl. 177—147** **6 Claims**



1. A weighing device, comprising:
means (**20**) connectable to one side of a frame supporting at least one horizontally extending member of a mass, for straddling said horizontally extending member;
means (**80**) carried by said straddling means for indicating a compressive loading;
means (**40**) supported by said indicating means and slidably positioned upon said straddling means for transmitting a compressive loading to said indicating means; and
means (**60**) attached to said transmitting means and extending from said straddling means for lifting said extending member from said frame.

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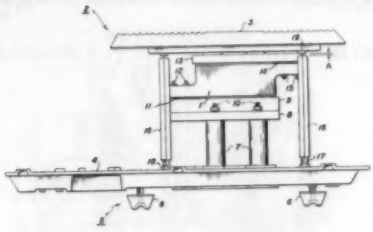
**4,479,561**

## WEIGHING CELL

**Seymour Feinland, Stamford; Gerald C. Freeman, Darien; Vincent F. Viera, Milford, and Paul R. Sette, Hamden, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Continuation of Ser. No. 239,267, Mar. 2, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,247**
**Int. Cl.³ G01G *23/02, 21/10***
**U.S. Cl. 177—154** **12 Claims**

1. A weighing cell for determining the weight of objects, comprising:
(a) a support to support such object while it is being weighed;
(b) a base member means for supporting said weighing cell;
(c) a load cell operatively connected between said support and said base member means, said load cell providing an output signal corresponding to the load placed on said support by said object;
(d) protecting means for protecting said load cell from overload forces applied to said support; and



(e) damping means for substantially reducing the time required for vibrations caused when such object is placed on said platform to decrease to a level such that the weight of such object may be determined, said damping means being operatively positioned between said base member means and a mechanical ground.

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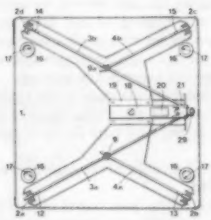
**4,479,562**

## WEIGHING APPARATUS FOR USE AS SCALE FOR PERSONS

**Guy Mairot, and Jean P. Aumard, both of Annemasse, France, assignors to Terraillon, Annemasse, France**

**Filed Jul. 19, 1982, Ser. No. 399,524**
**Claims priority, application Switzerland, Jul. 31, 1981, 4972/81**
**Int. Cl.³ G01G *21/18***
**U.S. Cl. 177—256** **5 Claims**



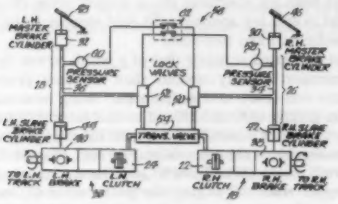
1. Weighing apparatus for use as scale for persons, comprising a base (**1**) and weighing mechanism supporting a tray designed to receive the load to be weighed and to be vertically mobile, the weighing mechanism consisting of four levers (**3***a*, **3***b*, **4***a*, and **4***b*) pivoting at their points of support located on the base at the four corners of a rectangle, two of the levers (**3***a*, **3***b*) being fixed to a flat spring (**18**) provided with at least one gauge (**20**) connected to a read-out system through an electric circuit for measuring the bending of the spring, the two other levers (**4***a*, **4***b*) which are shorter being coupled by the ends which are opposite to their points of support with the levers **3***a* and **3***b* at some point on these levers located between their ends,
characterized by a force transmitting member (**29**) hanging to the flat spring (**18**) and on which member (**29**) the free end of the two long levers (**3***a*, **3***b*) which are structurally separate, rest **6**.

**4,479,563**

## CRAWLER TRACK TRANSMISSION SYSTEM

**Rudolf Horsch, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.**

**Filed Nov. 26, 1982, Ser. No. 444,680**
**Int. Cl.³ B62D *11/08***
**U.S. Cl. 180—6.7** **7 Claims**




1. A transmission control system for a crawler drive having right-hand and left-hand crawler tracks respectively driven by a transmission assembly having right-hand and left-hand clutch means for selective delivery of power to a respective one of said tracks, and right-hand and left-hand brake means for selective braking of a respective one of said tracks, comprising:

right-hand brake cylinder means selectively operable for selectively applying said right-hand brake means;

left-hand brake cylinder means selectively operable for selectively applying said left-hand brake means;

right-hand conduit means associated in fluid communication with said right-hand brake cylinder means and said right-hand clutch means whereby activation of said right-hand brake cylinder means normally supplies pressurized fluid to said right-hand clutch means for disengagement thereof;

left-hand conduit means associated in fluid communication with said left-hand brake cylinder means and said left-hand clutch means whereby activation of said left-hand brake cylinder means normally supplies pressurized fluid to said left-hand clutch means for disengagement thereof; and

selectively activatable override means associated with said right-hand and left-hand brake cylinder means and said right-hand and left-hand conduit means so that activation of said override means results in continued engagement of said right-hand and left-hand clutch means when said right-hand and left-hand brake cylinder means are operated simultaneously to apply both said right-hand and left-hand brake means,

said override means comprising fluid pressure sensing means associated with said right-hand and left-hand brake cylinder means, and selectively closeable valve means associated with said right-hand and left-hand conduit means and said pressure sensing means, whereby simultaneous operation of said right-hand and left-hand brake cylinder means activates said pressure sensing means to close said valve means and block fluid flow to said right-hand and left-hand clutch means from said right-hand and left-hand brake cylinder means,

said pressure sensing means comprising a right-hand electrical pressure sensor associated with said right-hand brake cylinder means for sensing operation thereof, and a left-hand electrical pressure sensor associated with said left-hand brake cylinder means for sensing operation thereof,

said valve means comprising an electrically operable right-hand fluid lock valve disposed in fluid communication with said right-hand conduit means for selectively blocking fluid flow from said right-hand brake cylinder means to said right-hand clutch means, and an electrically operable left-hand fluid lock valve disposed in fluid communication with said left-hand conduit means for selectively blocking fluid flow from said left-hand brake cylinder means to said left-hand clutch means.

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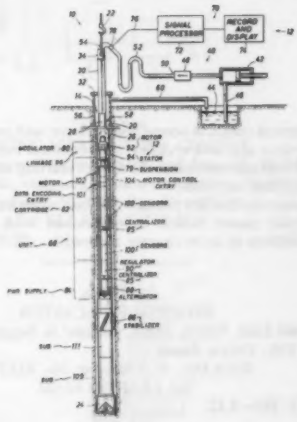
**4,479,564**

## SYSTEM AND METHOD FOR MONITORING DRILL STRING CHARACTERISTICS DURING DRILLING

**Denis R. Tanguy, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 029,423, Apr. 12, 1979, Pat. No. 4,303,994. This application Nov. 30, 1981, Ser. No. 325,630**
**The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.**
**Int. Cl.³ G01V *1/40***
**U.S. Cl. 181—105** **23 Claims**




1. A system operable during the drilling of a borehole for producing a signal useful in predicting the path which the drill bit of a drill string will take during continued drilling, at least a lower portion of the drill string varying in rotational orientation about its axis during drilling, comprising:

a. means coupled downhole to said drill string for generating at least one reference signal representing rotational orientation of said lower portion of the drill string relative to a predetermined direction;

b. means coupled downhole to said drill string for generating a strain signal representing bending moments applied to said lower portion of the drill string, said strain signal being coherent with respect to the varying rotational orientation of said lower portion of the drill string; and

c. means for phase-correlating said reference signals with said strain signal to generate an output signal representing the magnitude and direction of said applied bending moments.

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**4,479,565**

## CONTROL APPARATUS FOR A.C. ELEVATOR

**Masami Nomura, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 30, 1982, Ser. No. 403,874**
**Claims priority, application Japan, Aug. 4, 1981, 56-122114**
**Int. Cl.³ B66B *1/32***
**U.S. Cl. 187—29 R** **5 Claims**

1. A control device for controlling an A.C. elevator comprising:

a commercial A.C. voltage source;

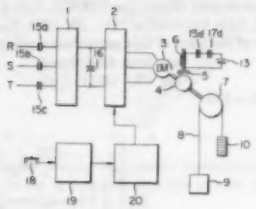
a rectifier device for rectifying a voltage output from said commercial A.C. source;

a capacitor for smoothing a rectified output voltage of said rectifier device;

an inverter for converting a smoothed output voltage from said capacitor into an A.C. voltage with a variable frequency;

an A.C. motor for driving an elevator car with the A.C. voltage thus converted by said inverter;

a brake means for braking A.C. motor, said brake means having an electrical circuit for controlling its braking operation;



electrical contacts connected between said commercial A.C. source and said rectifier, said contacts being respectively closed and opened at the time of starting and stopping said elevator car; and

at least one contact provided in said electrical circuit of said brake means which is interlocked with said electrical contacts so as to operate therewith.

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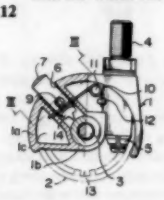
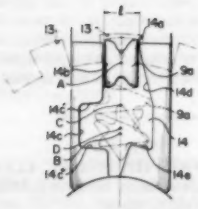
**4,479,566**

## STOPPER FOR CASTER

**Hiroyuki Ishii, Tokyo, Japan, assignor to Sugatsune Industrial Co. Ltd., Tokyo, Japan**

**Filed Dec. 23, 1981, Ser. No. 333,740**
**Int. Cl.³ F16D** *63/00*
**U.S. Cl. 188—1.12** **2 Claims**





1. A caster, comprising in combination:

(a) a frame (**1**) with wheels (**2**) at two sides of the frame and stopper recesses (**13**) along the periphery of the wheels;

(b) a radial narrow mounting aperture (**6**) defined in said frame, a cam groove (**14**) with narrow outer and inner parts, and a wide central part defined in said mounting aperture (**6**), said cam groove (**14**) having an open outer end (**14***a*), an oblique edge (**14***d*) on one side of said groove inclined from the cam groove wide central part of the narrower outer part, a step (**14***e*) defined in the inner part of said groove, a central cam recess (**14***c*) with an upper edge (**14***c*″) and a lower edge (**14***c*″) on the other side of the central part of said groove, so that said oblique edge (**14***d*) and said cam recess (**14***c*) form an enlarged chamber in the central part of said cam groove (**14**), and said step (**14***e*) and lower edge (**14***c*″) form a narrow chamber in the inner part of said cam groove;

(c) a push-button (**7**) with a lower portion, mounted in said aperture (**6**) said lower portion having push-button legs (**7***a*) with leg apertures (**8**), a stopper rotor (**9**) rotatably held in said leg apertures (**8**), said stopper rotor having a middle part and two ends;

(d) an elongated actuator (**9***a*) of a width across its shortest dimension slightly smaller than the cam groove open outer end (**14***a*), said actuator (**9***a*) being mounted in said cam groove (**14**) and affixed to said stopper rotor middle part, stopper means (**9***a*) disposed for engaging said stopper recesses (**13**) at each end of said stopper rotor (**9**), spring means (**10**) affixed to said frame and engaging said stopper rotor (**9**) urging the push-button (**7**) out of the frame (**1**) and preventing the removal of the stopper rotor (**9**) from said push-button legs (**7***a*), projections (**9**″) on the outer ends of said actuator (**9***a*), whereby, when said push-button is pushed and said stopper means (**9***e*) engage a stopper recess (**13**), the actuator (**9***a*) is pressed into the cam groove (**14**) and a projection (**9**″) contacts the step (**14***e*) rotating the actuator and the stopper rotor (**9**), when the push-button is released, the actuator (**9***a*) is raised upward so that a projection (**9***a*″) will engage the upper edge (**14***c*′) of said central cam recess (**14***c*); when the push-button is depressed in the lock-released state, the actuator (**9***a*) is lowered and a projection (**9***a*″) contacts the step so that the actuator is rotated towards the lower edge (**14***c*″), and, when the push-button is released, another end projection (**9***a*″) of the actuator will contact the upper edge (**14***c*′) of the recess (**14**), rotating the actuator further and be guided to the opening (**14***a*) of the cam groove, the stopper (**9***e*) is then engaged with the stopper recess and locked therein.

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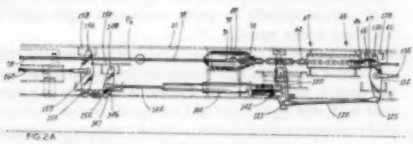
**4,479,567**

## VERTICAL RAILWAY CAR AIR BRAKE SYSTEM

**Arthur C. Pearson, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.**

**Filed Aug. 2, 1982, Ser. No. 404,205**
**Int. Cl.³ B61H** *13/38, 15/00*
**U.S. Cl. 188—47** **4 Claims**



1. An air brake arrangement comprising: an air brake cylinder mounted longitudinally of the car; an air brake piston extending outwardly from said air brake cylinder and connecting to a vertically extending floating cylinder lever; a slack adjuster connected to a midportion of the floating cylinder lever and extending a first direction; a first longitudinally extending brake rod connected to the distal end of said floating cylinder lever and extending in a second direction opposite to said first direction; said first longitudinally extending rod connected to a first vertically extending brake lever mounted at its opposite end on the car body; a second longitudinally extending brake rod connected to the midportion of said first vertically extending brake lever, and connected at its opposite end to a first vertically extending brake beam lever; said brake beam lever connected to a brake beam which applies the brakes to a wheel located on a first end of the car; said slack

adjuster including a slack adjuster rod extending in said first direction and which is connected to at least one second vertically extending brake lever in the midportion of said second lever; a third longitudinally extending brake rod connected to the midportion of at least one of the second and a third vertically extending levers and extending longitudinally in the first direction; said third longitudinally extending brake rod connected at its opposite end to a vertically extending second brake beam lever; said second brake beam lever connected to a fulcrum means then connected to the truck frame; said second brake beam lever at its opposite end connected to a brake beam which applies the brakes to a wheel located on the second end of the car.

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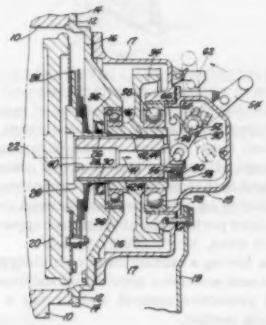
**4,479,568**

## TRANSMISSION DISCONNECT UTILIZING AN AXIALLY SHIFTABLE DRIVE COLLAR

**Faro D. Palazzolo, Oakland, Mich.; Roland A. Magnuson, and Earl S. Aoki, both of King, Wash., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 21, 1982, Ser. No. 370,306**
**Int. Cl.³ F16D *11/00***
**U.S. Cl. 192—67 R** **1 Claim**



1. In an engine-transmission assembly wherein the engine includes a flywheel that carries an internally splined drive collar, and the transmission comprises a housing structure having an opening therein freely receiving the drive collar: the improvement comprising an input gear disposed within the transmission housing in axial alignment with the drive collar; two axially spaced anti-friction bearings having their outer races engaged with the transmission housing and their inner races engaged with the gear, whereby the gear is mounted for rotational movement around its central axis; said input gear having an axial opening therethrough, the internal surface defined by the opening in the gear having axial splines formed thereon; a floating connector shaft slidably disposed within the opening in the input gear for axial motion toward or away from the drive collar; said connector shaft extending completely through the gear and therebeyond, so that a first end of the shaft is exposed to the space within the drive collar and a second end of the shaft is exposed to a space beyond the gear remote from the drive collar; said connector shaft external splines thereon continually engaged in the grooves defined by the transmission input gear splines to preclude relative rotation between the shaft and gear; manually-operated means for moving the floating connector shaft between a drive position extending into the drive collar and a disconnect position retracted away from the drive collar; said connector shaft having only the above-noted disconnect position and the above-noted drive position; said manually-operated means comprising an anti-friction collar encircling the second end of the connector shaft, means permitting the shaft to rotate freely on its axis without transmitting shaft rotational force to the anti-friction collar, a yoke element swingable on an axis transverse to the connector shaft axis, and a force connection between the yoke element and anti-friction collar whereby swingable motion of the yoke element causes the anti-friction collar to draw the shaft to its disconnect position even though the shaft may be rotating; and spring means operable to normally urge the connector shaft toward its drive position; alternate ones of the splines on the drive collar terminating inwardly from the drive collar end face presented to the connector shaft; alternate ones of the splines on the connector shaft terminating inwardly from the shaft end face presented to the drive collar; said alternate splines defining free zones for allowing the leading ends of the other splines on the shaft and drive collar to circumferentially overlap one another as the spring means forces the connector shaft into the drive collar.

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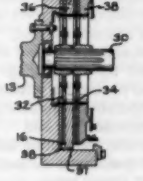
**4,479,569**

## SPRING MEANS FOR A CLUTCH

**Martin E. Kummer; William H. Sink, and James K. Tarlton, all of Auburn, Ind., assignors to Dana Corporation, Toledo, Ohio**

**Filed Apr. 14, 1982, Ser. No. 368,381**
**Int. Cl.³ F16D *13/52, 3/12***
**U.S. Cl. 192—70.20** **24 Claims**



1. A clutch device comprising:

a rotatable drive member having a substantially planar face and a circular flange extending from the outer periphery of said face;

a driven member;

an engaging plate means rotatable with and axially moveable relative to said drive and driven members, said engaging plate means having a circular outer periphery containing at least one slot therein, said slot being substantially rectilinear and sidewalls of said slot being substantially perpendicular to said face of said drive member;

at least one lug extending from said circular flange of said drive member, said lug containing a shaft positioned in and extending from said circular flange and a drive block pivotally positioned on said shaft, said drive block having a substantially rectilinear shape for alignment in said slot in said engaging plate means, said lug being disposed for engagement with said slot on said engaging plate means; and

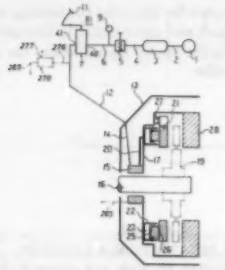
spring means positioned adjacent said circular flange, said spring means engaging one side of said substantially rectilinear drive block of said lug and said face of said drive member to align and maintain said drive block of said lug in alignment with said slot, said spring means resiliently engaging said engaging plate means whereby said spring means reduces torsional and tumbling induced rattle in said clutch.

4,479,570

## PNEUMATIC CLUTCH FOR AN AUTOMOBILE

Takenori Kamio, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed May 25, 1982, Ser. No. 381,758
Claims priority, application Japan, May 26, 1981, 56-80455; May 28, 1981, 56-82227
Int. Cl.³ F16D *25/063*
U.S. Cl. 192—85 AA 3 Claims



1. A pneumatic clutch apparatus for an automobile comprising:

a flywheel having a clutch cover fixed thereto;

a pressure plate axially movably connected to said clutch cover;

a clutch disc disposed between said flywheel and said pressure plate and having an output shaft splined thereto;

an annular pneumatic actuator disposed between said pressure plate and said clutch cover and operable to force said pressure plate against said disc;

a rotary joint around said output shaft;

an inching valve for controlling the pneumatic pressure applied to said pneumatic actuator;

a clutch pedal operatively connected to said inching valve;

a source of compressed air; and

pneumatic lines interconnecting said source of compressed air with said pneumatic actuator through said inching valve and said rotary joint;

said inching valve comprising an upper body portion, a lower body portion, and a diaphragm arranged between said upper and said lower body portions;

said lower body portion having a small aperture therein between an air inlet and an air outlet, and a valve seat formed at the lower end of said small aperture with an annular passage therearound;

a vertical hollow cylindrical valve member positioned in said small aperture and having its upper end fixed to said diaphragm and extending therethrough;

a large aperture in said lower body portion extending downward from said small aperture and having disposed therein a valve disc supported on a spring seat and held in contact with said valve member by a compressible conical spring;

a pressure chamber in said lower body portion adjacent said diaphragm and connected with said air outlet;

a vertical rod extending upwardly through the top of said upper body portion having its upper end connected to said clutch pedal so as to be raised up when said clutch pedal is pushed down, said rod having a deep hole formed in a lower end portion;

an annular spring seat having an integral cylindrical portion fitted in said deep hole and a stem slidably fitted in said cylindrical portion, said stem having a stopper at its upper end and a disc shaped spring seat fixed to its lower end and having a lower face resting on the upper end of said hollow cylindrical valve member;

a compressible conical main spring positioned between said annular spring seat and said disc shaped spring seat;

said inching valve functioning to smoothly change the rate-of-change of pneumatic pressure applied to said pneumatic actuator to effect rapid release of the clutch from the engaged position when said clutch pedal is pushed down, and to effect delicate control of the clutch engaging operation as said clutch pedal is raised.

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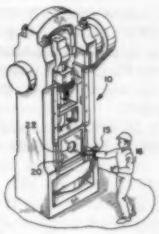
4,479,571

## PROTECTIVE GLOVE SYSTEM

Sigdon A. Eliot, c/o Columbus Forge & Iron Co., 544 West First St., Columbus, Ohio 43215

Filed Nov. 23, 1981, Ser. No. 323,526
Int. Cl.³ F16P *3/06*
U.S. Cl. 192—129 A 6 Claims



1. An item of protective apparel for use with press machinery or the like having a hazardous region of operation which is accessed through an aperture of limited extent, said aperture being in fixed space relation to said hazardous region, said protective apparel limiting the extension of a hand therein from entry into said hazardous region and comprising:

means defining an annular essentially rigid collar surrounding an inner portion of said protective apparel adjacent the wearer's wrist,

said collar having a radially inner encircling portion thereof fixed to said protective apparel and stabilized with respect to said protective apparel, and having a radially outer encircling portion,

said collar forming an abutment which cannot pass through said aperture and is relatively fixed in relation to a transverse plane through said protective apparel to limit the extension of the wearer's fingers to a predetermined maximum position forward of said collar and outside of said hazardous region.

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4,479,572

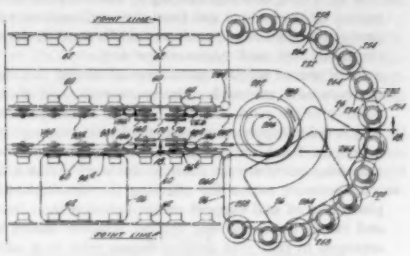
## CONVEYOR SYSTEM

William J. Merz, 220 W. Rittenhouse Sq., Philadelphia, Pa. 19103

Filed Nov. 10, 1981, Ser. No. 319,975
Int. Cl.³ B65G *21/20*
U.S. Cl. 198—345 25 Claims

1. A conveyor system comprising a frame, a plurality of rollers rotatably mounted on said frame, said rollers being disposed in spaced, adjoining relation to sequentially receive and transport articles therealong, a drive arrangement comprising a shaft extending coaxially from each roller, first and second wheels disposed in spaced relation on each said shaft, one of said first and second wheels of each shaft comprising a drive wheel and being fixed to the shaft and the other comprising an idler wheel and being freely rotatable with respect thereto, an endless belt passing in one flight alternately over and under the first wheels of said shafts and in another flight alternately over and under the second wheels of said shafts, drive means for driving said belt, a turning station for effecting relatively sharp changes in the direction of the article path, said turning station comprising a central wheel rotatably mounted on said frame for rotation about a substantially vertical axis, said central wheel including an article-supporting

annular flange extending substantially horizontally therefrom, a plurality of peripheral wheels disposed in spaced relation from said central wheel in a substantially arcuate arrangement concentric with said central wheel, said peripheral wheels



being mounted on said frame for rotation about substantially verticle axes and each including article-supporting annular flanges extending substantially horizontally therefrom, and drive means for driving said central wheel and said peripheral wheels.

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**4,479,573**

## GAUGING ASSEMBLY FOR CAPSULE ORIENTING AND TURNING APPARATUS

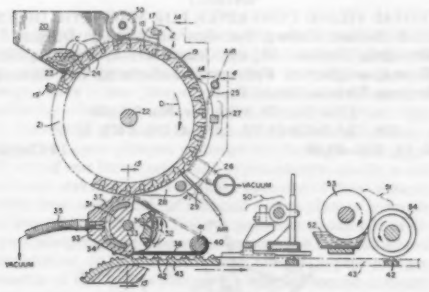
**Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.**

**Division of Ser. No. 137,850, Apr. 7, 1980, Pat. No. 4,372,437. This application Feb. 4, 1983, Ser. No. 463,972**

**The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.**

**Int. Cl.³ B65G *47/24***

**U.S. Cl. 198—399** **4 Claims**



1. Transport apparatus for objects having body portions of different dimensions relative to a common axis, including rotatable carrier means for receiving said objects individually and transporting said received individual objects along a predetermined path and means adjacent said path for restraining selected ones of said moving objects from moving in other than said transport direction by interference with larger size body portions of said objects but permitting others of said moving objects to move additionally to the transport direction as all of said objects continue moving in said transport direction by free passage of smaller size body portions of said objects past said restraining means, wherein said restraining means is adjustably moveable in a direction other than said direction of transport, to alter the size of objects restrained by shifting the area, in which said smaller size body portions move freely past said restraining means, transversely with respect to said transport direction, in a direction parallel with the axis of rotation of said rotatable carrier means.

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**4,479,574**

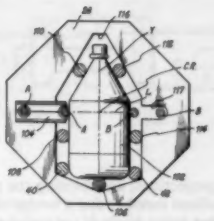
## CONTAINER TRANSPORT APPARATUS

**Richard F. Julius, Silver Spring, Md., and John C. Lund, Springfield, Va., assignors to S. J. Industries, Inc., Alexandria, Va.**

**Filed Apr. 21, 1982, Ser. No. 370,470**

**Int. Cl.³ B65G *15/14***

**U.S. Cl. 198—626** **8 Claims**



1. Container transport apparatus for transporting containers comprising: container guide means for guiding said containers; container moving means associated with said container guide means for moving containers, said container moving means comprising a first movable elongated member having a portion thereof located in position to contact one side of said containers, a second movable elongated member having a portion thereof located in position to contact the opposite side of said containers and nonrotating guide members for slidably supporting said first movable elongated member located so portions of said first movable elongated member being guided contact one side of said containers; and nonrotating guide members for slidably supporting said second movable elongated member located so portions of said second movable member being guided contact the opposite side of said containers, said guide members for said first movable elongated member and said guide members for said second movable elongated member being located to alternate with each other to avoid pressure points which could occur if said guide members for said first movable elongated member were located substantially opposite said guide members for said second movable elongated member, said guide members for said first movable elongated member having a portion thereof substantially surrounding a portion of the outer circumference of said first movable elongated member, said guide members for said second movable elongated member having a portion thereof substantially surrounding a portion of the outer circumference of said second movable elongated member, said guide members being shaped to surround said elongated members to the extent that said elongated members are laterally retained by said guide members while still permitting a lateral portion of said elongated members to protrude from said guide members and contact said containers, and drive means associated with said movable elongated members for driving said movable elongated members.

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**4,479,575**

## RETAINING DEVICE

**Dieter Gründken, Lüen; Reinhold Brüggemann, Dortmund; Horst Linke, and Manfred Redder, both of Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany**

**Filed Mar. 18, 1983, Ser. No. 476,580**

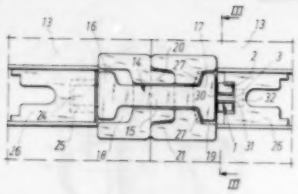
**Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 8207596[U]**

**Int. Cl.³ B65G *19/28***

**U.S. Cl. 198—735** **18 Claims**

1. In connection means for connecting two components of a

mineral mining installation, the connection means comprising an elongate coupling member which is insertible into laterally-open recesses formed in the two components, the laterally-open recesses defining an elongate aperture which is slightly longer than the coupling member so that the coupling member is received within the aperture with a predetermined amount of axial play, and a retaining device for preventing axial movement of the coupling member within the aperture by filling up the space available for said predetermined amount of axial play, the improvement comprising providing the aperture with



two latching projections, and forming the retaining device by a C-shaped resilient member and a wedge-shaped member, the resilient member being made of corrosion-resistant resiliently-deformable material and having two symmetrically-positioned thickened wall portions, the retaining device being such that the wedge-shaped member can be driven into the resilient member to expand said thickened wall portions against and behind said latching projections thereby fixing the retaining device in position, and such that the wedge-shaped member is held captive within the resilient member when the retaining device is fixed in position.

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**4,479,576**

## TRANSLATOR-BAR CONVEYOR INSTALLATION

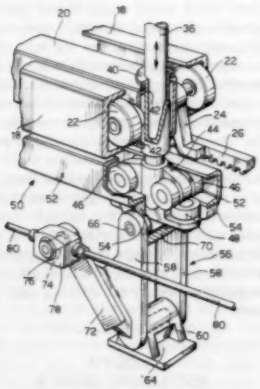
**Gaetano Di Rosa, Pino Torinese, Italy, assignor to FATA European Group S.p.A., Turin, Italy**

**Filed Apr. 29, 1982, Ser. No. 373,303**

**Claims priority, application Italy, May 11, 1981, 67632 A/81**

**Int. Cl.³ B65G *25/00***

**U.S. Cl. 198—774** **7 Claims**



1. A conveyor installation for displacing components along an assembly line which includes a series of spaced work stations, said installation comprising:

a fixed mounting structure,

a pair of horizontal translator bars moveably mounted in said fixed structure and extending longitudinally along the assembly line for the purpose of transporting said components between the work stations,

first actuator means for effecting joint reciprocal movement of the translator bars parallel to the said assembly line with a forward and return stroke equal to the interval between each pair of adjacent said work stations, whereby to horizontally transfer each said component from the region of one said station to the next, and

means for setting down and taking up the components transported by the bars, at and from the work stations respectively at the end of and prior to, said forward stroke of the translator bars, said means comprising:

a series of spaced support means carried on said two translator bars and moveable relative thereto, and therefore relative to the work stations, between raised positions in which the components are carried by said support means up off the work stations and lowered positions in which the components are set down at the work stations, and

second actuator means for effecting the simultaneous displacement of said support means between their lowered and raised positions, said second actuator means being arranged to raise said support means prior to a said forward stroke of the transporter bars whereby to take up the components from the work stations in preparation for their movement by the bars to the next stations, and to lower said support means at the end of said forward stroke whereby to set down the components at said next stations, and

wherein said translator bars are provided with vertical guide passages and the said support means are formed by vertical columns mounted for axial sliding between said raised and lowered positions in corresponding ones of said guide passages, the installation further comprising, beneath the said translator bars, two horizontal, vertically-moveable, support and guide structures in which the lower ends of the said columns slidingly engage and on which the said second actuator means operate, and

wherein each of the said columns is provided at its lower end with a trolley incorporating horizontal-axis guide rollers and vertical-axis counter rollers cooperating with the said support and guide structures.

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**4,479,577**

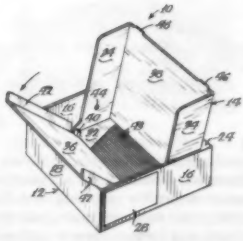
## PIVOTAL FILING CONTAINER FOR MAGNETIC DISKS

**Falk J. Eichner, Coburg, Fed. Rep. of Germany; Douglas S. Ramsdale, Palatine, Ill., and Jean Bourbon, Saint Lupicin, France, assignors to Fellowes Manufacturing Co., Eichner Systems Division, Itasca, Ill.**

**Filed Oct. 31, 1983, Ser. No. 547,100**

**Int. Cl.³ B65D *85/57, 1/24, 43/24;* A47B *63/00***

**U.S. Cl. 206—45.18** **14 Claims**



1. A container for filing generally flat articles such as magnetic disks, comprising:

an outer support portion having a pair of laterally spaced sidewalls, and a front wall extending between respective ends of said sidewalls;

an inner file portion disposed generally within said outer support portion and configured to receive said articles, said inner file portion including an end wall, a pair of laterally spaced sidewalls extending from said end wall,

and spaced front and rear walls extending between said file portion sidewalls;

means pivotally connecting each of said inner file portion sidewalls to a respective one of said outer portion sidewalls, whereby said inner file portion is relatively pivotal about an axis with respect to said outer support portion from a closed position wherein said inner file portion is disposed generally between said outer portion sidewalls, to an open position wherein said inner file portion is disposed in generally upstanding relation to said outer support portion for permitting access to the articles in said file portion; and

indexing means for preventing unrestrained relative pivotal movement of said inner file portion to said open position after said file portion has been relatively moved from said closed position.

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**4,479,578**

## SINGLE BARREL TWO-COMPARTMENT MEDICAMENT CONTAINER ASSEMBLY

**Dominic J. Brignola, Phoenixville; Homer J. Brown, Oreland; Caroll S. Sutryn, Oaks, and Ralph Walters, Perkiomenville, all of Pa., assignors to The West Company, Phoenixville, Pa.**

**Filed Apr. 9, 1981, Ser. No. 252,588**

**Int. Cl.³ B65D** *81/32, 51/26*

**U.S. Cl. 206—221** **8 Claims**

1. A single barrel two compartment assembly for medicaments comprising an elongated cylindrical hollow barrel having a substantially uniform diameter, a normally sealed discharge end, a bypass plunger made of a pliable resilient material having a forward section of a diameter slightly greater than the diameter of the barrel in a relaxed state, means defining a seat in the bypass plunger, a plunger rod having a tip engageable in said seat for actuating said bypass plunger axially in said barrel and seal means for sealing the open end of the said barrel remote from said discharge end, said bypass plunger normally dividing said barrel into a first compartment to one side of the bypass plunger for a powder medicament and a second diluent compartment on the opposite side of said bypass plunger, actuation of said bypass plunger toward said second compartment creating an increase in hydrostatic diluent pressure and relaxation of the sealing engagement of said plunger forward section and said bore of the barrel thereby permitting diluent to bypass the periphery of said plunger to mix with said powder medicament in said first compartment.

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**4,479,579**

## NON-DUBLICABLE MAGNETIC DISK JACKET AND METHOD OF MANUFACTURE

**Richard L. Miklos, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 24, 1982, Ser. No. 444,301**

**Int. Cl.³ B65D** *73/00, 85/30, 85/57*

**U.S. Cl. 206—309** **13 Claims**

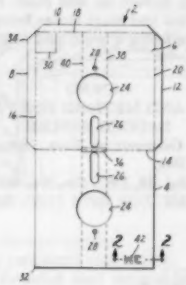
1. A method of forming a duplication-resistant disk jacket adapted to receive and enclose a magnetic recording disk comprising the steps of:

providing a flat paper or polymer stock material;

perimeter cutting said stock material to produce a jacket blank;

partially assembling said jacket blank to form a partially-assembled disk jacket;

imparting indicia to one surface of said jacket blank prior to partially assembling said jacket blank in an area and in a



manner which cannot be duplicated in a partially-assembled disk jacket not provided with said indicia prior to partially assembling said jacket blank;

inserting said magnetic recording disk into said partially-assembled disk jacket; and

assembling completely said jacket blank to form an assembled, duplication-resistant disk jacket enclosing said magnetic recording disk.

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**4,479,580**

## CASING FOR RECEIVING CASSETTE

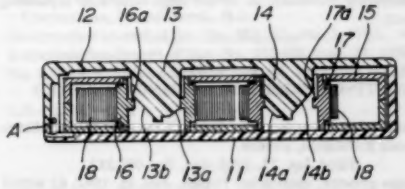
**Hideo Shirako, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Mar. 23, 1983, Ser. No. 478,164**

**Claims priority, application Japan, Mar. 24, 1982, 57-41524[U]**

**Int. Cl.³ B65D** *85/672*

**U.S. Cl. 206—387** **2 Claims**




1. A case for receiving therein a tape cassette having a pair of spaced apart tape hubs with centrally located openings therein comprising:

a box member having an open top for receiving therein said cassette, and a first and a second pair of generally parallel opposed sides, said box member being shaped to receive said cassette in a position where said hubs are spaced apart in a direction extending parallel to said first pair of sides;

a cover for opening and closing said open top of said box member;

hinge means mounting said cover for pivotal movement to open and close said top of said box member along one of the sides of said second pair of sides; and

a pair of engaging members mounted on the inner side of said cover positioned for engagement, respectively, within said openings in said tape hubs, one of said engag-

ing members being located closer to said hinge means and the other of said engaging members being located further away from said hinge means;

said engaging members each being formed with a pair of opposed slanting surfaces, one surface each of said pair facing toward said hinge means and the other surface of each of said pair facing away from said hinge means;

with the slanting surface on said one engaging member facing toward said hinge means being steeper than the slanting surface facing away from said hinge means; and

with the slanting surface on said other engaging member facing away from said hinge means being steeper than the slanting surface facing toward said hinge means.

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**4,479,581**

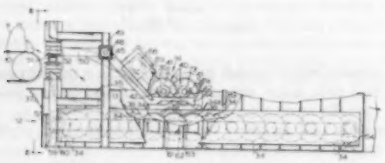
## APPARATUS AND METHOD FOR PROCESSING BAGGED REFUSE

**John Kelyman, Jr., Germantown, Tenn., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Jul. 29, 1982, Ser. No. 403,158**

**Int. Cl.³ B02C *7/04*; B07B *13/05*; B03B *1/00***

**U.S. Cl. 209—3** **17 Claims**



11. A method of processing raw refuse, comprising:

receiving raw refuse including bagged refuse at an upstream location on a disk screen separating bed comprising a series of interdigitated rotatable disk assemblies, said assemblies comprising screen disk assemblies and bag breaker disk assemblies;

moving said refuse including said bagged refuse in a downsteam direction along said bed;

and operating bag breaker means above and in cooperation with said bag breaker disk assemblies as the refuse moves along said bed, gripping the bagged refuse by and between said breaker means and said bag breaker disk assemblies and thereby breaking the bags of said bagged refuse and liberating the contents of the bags onto said separating bed.

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**4,479,582**

## SORTING DEVICE FOR SORTING CONVEYED OBJECTS

**Marcel Ducloux, Carrieres Sur Seine, France, assignor to Saint-Gobain Emballage, France**

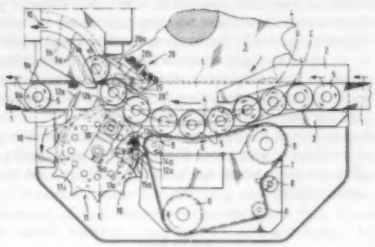
**Filed Jan. 11, 1983, Ser. No. 457,213**

**Claims priority, application France, Jan. 15, 1982, 82 00603**

**Int. Cl.³ B07C *5/02***

**U.S. Cl. 209—552** **9 Claims**

1. Apparatus for sorting continuously any objects as determined by process criteria from a succession of objects and preventing each sorted object from entry with non-sorted objects to a main path of movement, comprising a distributor including a distributing wheel movable rotationally about a vertical axis for moving all objects along a second path, an element at the end of said second path for urging each object during movement with said distribution wheel toward said main path, an ejecting wheel likewise supported for movement rotationally about an axis parallel to said first-mentioned axis, a plurality of pins, each having an elongated length, carried by said ejecting wheel, said ejecting wheel being synchronized in movement so that said pins in succession when deployed in operation are adapted to act along their length upon successive objects moving with said distributing wheel along said second path between said ejecting and distributing wheels for overcoming action of said element whereby each object to be sorted continues movement with said distributing wheel, each elongated length of each said pin having a convex bearing



surface toward said path for acting on an object to be sorted, and a shaft equal in number to the number of pins for mounting said pins for sorting deployment, each said shaft being carried by said ejecting wheel downstream in movement of said ejecting wheel.

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**4,479,583**

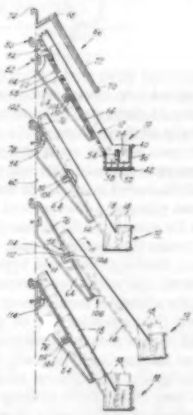
## GRAVITY FEED DISPLAY RACKS WITH MEANS FOR PRESENTATION OF UNITS OF MERCHANDISE AND FOR RELOADING

**Robert P. Franklin, Lake Hopatcong, and John G. Dewees, Morristown, both of N.J., assignors to Trans-World Manufacturing Corporation, East Rutherford, N.J.**

**Filed Mar. 1, 1982, Ser. No. 353,239**

**Int. Cl.³ A47F *1/00***

**U.S. Cl. 211—49 D** **5 Claims**



1. A display apparatus, comprising:

a support wall;

a plurality of identical display racks; and

a plurality of identical mounting means, each of said mounting means being associated with a different said display rack for slidably coupling its associated rack to said support wall such that each of said display racks is movable between a display position and a loading position, said display rack being closer to said wall when it is in said display position than when it is in said loading position;

each of said display racks comprising:

a plurality of primary receptacles having a size and shape

adapted to hold a single item of merchandise of a predetermined size and shape in a predetermined orientation;

a plurality of chutes equal in number to the number of said primary receptacles, each said chute being associated with a different said primary receptacle and extending above its associated said primary receptacle and opening into its associated said primary receptacle, each of said chutes having a size an shape adapted to hold a plurality of said items of merchandise in a stack one atop the other and in a different orientation than said predetermined orientation; and

the relative position of each said receptacle and its associated said chute being such that when said single item of merchandise is removed from said receptacle, the lowermost one of said stack of items of merchandise located in said associated chute is pulled into said receptacle by the force of gravity and is oriented in said predetermined orientation by said shape and size of receptacle.

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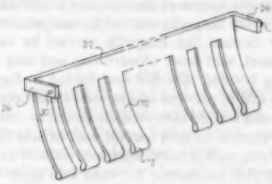
**4,479,584**

## STORAGE AND DISPENSING MEANS FOR SANITARY COMMODITIES

**Zeev Raz, Beer Sheva, Israel, assignor to Shilemay Plastics Products Ltd., Tel Aviv, Israel**

**Filed Aug. 31, 1981, Ser. No. 297,850**
**Int. Cl.³ A47F *5/08***
**U.S. Cl. 211—89** **2 Claims**



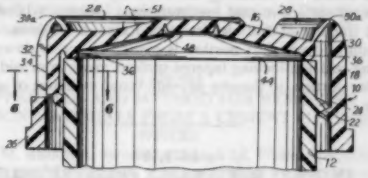
1. In a compartment for frictionally retaining and dispensing of different objects comprising at least a rear wall, a bottom portion, a front wall and a horizontally spaced pair of lateral side walls joining said rear and front walls and defining grooves on the facing surfaces thereof, and further comprising a set of juxtaposed spring like tongues the upper ends of which are immobilized and lie in a plane substantially coinciding with the plane of said rear wall and wherein an object can be pushed into said compartment only by flexing at least one of said spring like tongues back in a direction towards said rear wall, whereby said object is frictionally retained in said compartment by the restoring force of said flexed spring like tongues clamping said object between the inside surface of said front wall and said flexed spring like tongues, the improvement comprising providing a set of spring like tongues for frictionally retaining and dispensing sanitary commodities such as tampons, Tampax cartridges and the like, said spring like tongues being pre-bent in such a way that starting from their immobilized ends they gradually continuously curve substantially along their entire length away from said rear wall and toward said front wall and end at points substantially adjacent said front wall and below the upper edge thereof, the free ends of said spring like tongues being rounded off about an axis extending substantially across the width of said spring like tongues and forming a contact line parallel to said axis to prevent said free ends from catching in and damaging the surfaces of said sanitary commodities when the latter are withdrawn from said compartment by minimizing the contact area therebetween, said set including mounting means provided at its ends with arms extending substantially perpendicularly therefrom in a horizontal plane and adapted to be flexed to enter said grooves of said lateral compartment side walls.

**4,479,585**

## TAMPER RESISTANT SAFETY CLOSURE AND CLOSURE-CONTAINER COMBINATION

**Jeffrey Sandhaus, Rte. 9W, Snedens Landing, N.Y.**

**Continuation-in-part of Ser. No. 399,237, Jul. 19, 1982, , which is a continuation-in-part of Ser. No. 355,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Nov. 15, 1982, Ser. No. 441,546**
**Int. Cl.³ B65D *55/02***
**U.S. Cl. 215—218** **34 Claims**



1. A safety closure comprising:

a top having a peripheral edge region;

an interiorly threaded skirt integral with and depending from the peripheral edge region of said top;

locking means formed integrally with said closure and movable under the action of actuating means from a locking position to a non-locking position;

actuating means for moving said locking means from the locking position to the non-locking position, said actuating means being constituted by at least a portion of said top of said closure which has a substantially dish-shaped locking configuration such that the application of a pressure on said top portion in excess of a certain minimum required pressure will deform said top into a non-locking configuration and result in movement of said locking means from the locking to the non-locking position; and

means for positively retaining said locking means in said non-locking position after movement thereto from said locking position.

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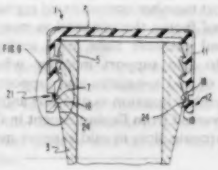
**4,479,586**

## TAMPER-EVIDENT CONTAINER WITH DROP DOWN SKIRT

**Ernest J. Csaszar, Mountainside, N.J., assignor to General Kap Corporation, Bound Brook, N.J.**

**Continuation-in-part of Ser. No. 383,705, Jun. 1, 1982, , which is a continuation-in-part of Ser. No. 142,429, Apr. 21, 1980, Pat. No. 4,343,408. This application Aug. 25, 1983, Ser. No. 526,488**
**Int. Cl.³ B65D *49/12***
**U.S. Cl. 215—258** **15 Claims**



1. A tamper-evident container comprising a container including a neck portion and an annular collar portion below said neck portion, and a closure for application to said container, said closure comprising a one piece closure body including a horizontal end wall and cylindrical side wall, said cylindrical side wall including an upper portion, a depending lower skirt portion, and an intermediate side wall portion therebetween, said depending lower skirt portion including an in-

wardly projecting bead having an internal diameter no greater than the outer diameter of said container at a predetermined location directly below said annular collar portion so as to provide an interference fit between said inwardly projecting bead and said container at said predetermined location, said intermediate side wall portion of said closure including a frangible portion comprising an area of weakness designed to fracture when said closure is removed from said container so as to leave said depending lower skirt portion on said container after said upper portion has been removed from said container, said container including an inwardly directed non-locking tapered surface at said predetermined location whereby after said fracture of said closure at said area of weakness said depending lower skirt portion is caused to move downwardly along said non-locking tapered surface, away from said annular collar portion, to thereby provide visual evidence of said fracture.

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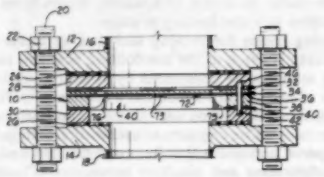
**4,479,587**

## TWO-WAY RUPTURABLE PRESSURE RELIEF APPARATUS

**Arnold L. Mundt, and Charles E. Beair, both of Tulsa, Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.**

**Filed Sep. 6, 1983, Ser. No. 529,363**
**Int. Cl.³ F16K** *17/40*
**U.S. Cl. 220—89 A** **10 Claims**



1. A two-way rupturable pressure relief apparatus adapted to be clamped between a pair of complementary connection members connecting first and second pressure zones comprising:

(a) a rupture member including a plurality of openings therein positioned with one side thereof facing the connection member connected to said first pressure zone;

(b) a support member including one or more arcuate slots defining a circular blowout portion and a hinge portion connected to the blowout portion therein, said support member being positioned adjacent the side of said rupture member opposite the connection member connected to said first pressure zone; and

(c) a flexible sealing member positioned adjacent the side of said support member opposite said rupture member with a side thereof facing the connection member connected to said second pressure zone, said sealing member being adhered to said support member whereby during the operation of said apparatus said support member and said sealing member function as one part and said sealing member is prevented from flexing except in the area of the one or more arcuate slots in said support member.

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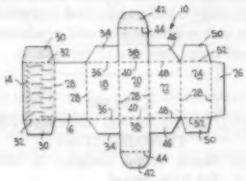
**4,479,588**

## SEALED CARTON WITH TAMPER INDICATING MEANS

**Robert E. Davis, Nutley; Patrick S. Maio, Ringwood, both of N.J., and Lawrence J. Growney, Pearl River, N.Y., assignors to Federal Paper Board Company, Inc., Montvale, N.J.**

**Filed Nov. 22, 1982, Ser. No. 443,754**
**Int. Cl.³ B65D** *5/02, 17/00*
**U.S. Cl. 220—416** **9 Claims**

1. A carton comprising a plurality of panels arranged to form walls of said carton, said walls including at least first and second pairs of walls with the walls of each pair being remotely disposed, said first pair of walls including first and second walls, said first wall of said first pair being a double wall and including inner and outer panels, said second pair of walls including first and second walls each of a double wall construction and being disposed next adjacent said first wall of said first pair of walls, said first wall of said second pair of walls including a first terminal panel and a first intermediate panel with said terminal panel being bonded to the interior of said intermediate panel, said second wall of said second pair of walls including a second terminal panel and a second intermediate panel, said second terminal panel being an exterior panel having an interior surface thereof bonded to said second intermediate panel, said second terminal panel having free edge disposed remote from said first wall of said first pair of walls and being generally of the same width as said second intermediate panel, said carton has at least one closed end formed by a plurality of closure members; said closure members including an outer closure flap hingedly carried by said second terminal panel, an inner closure flap hingedly carried by said second intermediate panel, said inner closure flap and said inner closure flaps being bonded together and folded to form part of said closed end and to prevent separation of said second terminal panel from said second intermediate panel, an outer closure panel hingedly carried by said second wall of said first pair of walls and overlying said closure flaps, said closure panel terminating in a tuck flap positioned between said inner and outer panels of said first wall of said first pair of walls, and securing means permanently bonding an inner surface of said tuck flap to an outer surface of said inner panel at a location which is completely inaccessible in the sealed carton.



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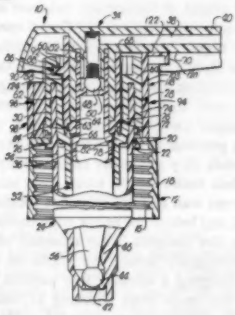
**4,479,589**

## PLUNGER LOCK FOR MANUAL DISPENSING PUMP

**John M. B. Ford, Lee's Summit, Mo., assignor to Realex Corporation, Lee's Summit, Mo.**

**Filed Jun. 7, 1982, Ser. No. 385,803**
**Int. Cl.³ B67D** *5/32;* **F16K** *35/00*
**U.S. Cl. 222—153** **12 Claims**



1. In a manually operated dispensing pump having a plunger reciprocable through a collar of the pump and normally rotatable about the longitudinal axis of the plunger, locking means for the plunger comprising:

an axial lock for releasably retaining the plunger in a depressed position against said reciprocal pumping movement,

said axial lock having components disposed to become disengaged from one another upon unlocking rotation of the plunger relative to the collar in a certain rotative direction when the plunger is in said depressed and locked position; and

a releasable rotary lock between the collar and the plunger for holding the plunger against said unlocking rotation thereof,

said lock including a pair of arms integrally interconnected at one end thereof and having interengageable latch means at the opposite ends thereof,

said arms being yieldably separable prior to engaging said latch means whereby to facilitate installation on and around said collar,

said lock further including a projection extending axially from said arms at said one end thereof in disposition for engaging a proximal portion of said plunger,

said collar being provided with a series of elongated knurls on the outer peripheral surface thereof extending axially with respect to the direction of plunger operation and with an unknurled, axially segmented, normally lower marginal edge portion,

said arms each having elongated, axially extending protrusions on the inner peripheral surface thereof,

said protrusions being only in that area of the arms disposed to engage said knurls,

the area of the arms disposed to engage said segments of the collar being devoid of protrusions.

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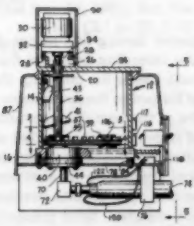
## 4,479,590
## HIGH VISCOSITY MATERIAL MELTING AND DISPENSING APPARATUS

**Fred A. Slautterback, Carmel Valley, Calif., assignor to Slautterback Corporation, Monterey, Calif.**

**Continuation-in-part of Ser. No. 291,554, Aug. 10, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,600**

**Int. Cl.³ B67D** *5/62*

**U.S. Cl. 222—146.5** **14 Claims**



1. Apparatus for melting and dispensing high viscosity thermoplastic material of the type having a chamber with heated walls, a bottom wall defining an exit port, a top wall defining a material entry port, the improvement comprising,

a conveyor having lengthwise sections disposed in a plane substantially parallel to the bottom wall of the chamber for imparting lateral rotary mixing motion to a mass of thermoplastic material loaded in said chamber, said conveyor having an end proximate to a chamber exit port, and

deflection means disposed in the chamber for directing material downward onto said conveyor sections, said deflection means comprising an angularly inclined first plate mounted on a rotating shaft projecting through the chamber wall, said shaft driving said conveyor sections.

4. Apparatus for melting and dispensing high viscosity thermoplastic material comprising,

a walled chamber with means for heating wall surfaces of the chamber, a wall surface defining a material entry port, a bottom wall defining a material exit port, a pump communicating with said exit port, and

a material conveyor means having linear sections disposed in a plane substantially parallel to the bottom wall of the chamber for imparting lateral rotary mixing motion to a mass of thermoplastic material loaded in said chamber, said conveyor means having an end proximate to said material exit port,

deflection means disposed in the chamber for directing material downward onto said conveyor sections, said pump being driven by a gear and said conveyor being driven by a shaft connected to said gear said conveyor trained about said gear and a pulley mounted on the bottom wall.

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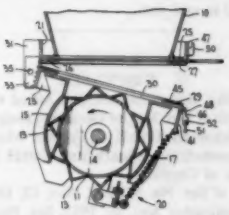
## 4,479,591
## APPARATUS AND METHOD FOR REMOVING FOREIGN MATERIALS FROM A CEMENT METERING WHEEL

**George M. Burkhart, Strasburg; Joseph M. White, Millersville, and Diane M. Witkonis, Lancaster, all of Pa., assignors to Barber-Greene Company, Aurora, Ill.**

**Filed Jul. 20, 1982, Ser. No. 400,044**

**Int. Cl.³ B01F** *15/02*

**U.S. Cl. 222—317** **6 Claims**



1. A mobile concrete mixer having a body member with separate storage tanks for storing concrete ingredients, means for feeding said ingredients from each of said compartments at controlled rates to movable conveyor means for eventual mixing of the ingredients, wherein one of said tanks is a cement storage tank and said means for feeding ingredients includes a cement feeder disposed at the bottom of said cement storage tank, and including a generally cylindrical chamber having a horizontally-disposed longitudinal axis and longitudinally-extending horizontal top and bottom openings to receive and discharge cement, respectively, from the cement storage bin, a rotatable drum disposed in said chamber, a plurality of angularly spaced vanes secured to the periphery of said drum and arranged to define rotatable compartments for cement between the vanes and the walls of said chamber, said cement feeder including clean-out means for providing access to said drum while preventing cement from spilling out of said storage tank, said clean-out means comprising:

gating means comprising a first gate member disposed at the bottom of said storage tank and a second gate member disposed at the top of said chamber, said gate members having frame-like configurations to permit free passage of cement from said storage tank through said gate members to said chamber;

pivotal engagement means securing said gate members to one another for pivotal motion about a generally horizontal axis between parallel abutting and angularly spaced limit positions and such that the weight of said chamber normally biases said second gate member downward and away from said first gate member to said angularly spaced position;

latching means for selectively engaging said first and second gate members together in said parallel abutting position;

wherein said first gate member has a generally horizontally disposed slot defined therein;

selectively removable slot cover means for covering said slot from the external environment to prevent spillage of cement which falls from the storage tank to said chamber during normal cement metering operation;

cement blocking means adapted to be inserted into said slot when said slot cover means is removed in order to prevent passage of cement from said storage tank through said first gate member,

said first gate member being a generally rectangular frame, wherein said slot is defined between two generally rectangular spaced lips which project inwardly from said rectangular frame in parallel relation, said slots being open to the environment external to said concrete mixer on only one side, and

said latching means comprising first and second latch and hook devices disposed in horizontally spaced locations along said one side of said slot on said first and second gate members; respectively, wherein said slot cover means includes first and second elongated cover members having L-shaped cross-sections in which one leg is adapted to fit partially into said slot from said open side, said cover members being arranged to fit side by side in said slot to cover said open side of said slot while permitting flow of cement through said first gate member, and wherein the other leg of each of said cover members includes a cut-out portion which partially surrounds a latch mechanism of a respective latching means when the cover members are positioned in said slot.

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## DISPENSER

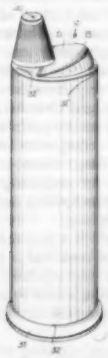
**Arnold E. Rüsing, Radevormwald, and Alfred von Schuckmann, Kevelaer, both of Fed. Rep. of Germany, assignors to Blendax-Werke R. Schneider GmbH & Co. and Mega Products-und Verpackungsentwicklung Marketing GmbH & Co., KG, both of, Fed. Rep. of Germany**

**Continuation of Ser. No. 321,040, Nov. 13, 1981, abandoned. This application Aug. 10, 1983, Ser. No. 522,241**

**Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044439; Jun. 26, 1981, 3125092**

**Int. Cl.³ G01F *11/00***

**U.S. Cl. 222—319** **19 Claims**



1. Dispenser for the portionwise dispensing of a material, in particular a paste, e.g. toothpaste, having a cylinder within which a piston moves stepwise relative to the cylinder in the direction toward a dispensing opening, while in the opposite direction it is clampable on the inner wall of the cylinder by means of a clip type reed spring arranged thereon, the dispensing opening being disposed at the same end of the dispenser at which pressure is to be applied, characterized in that the cylinder has a seat on its underside and is mounted for longitudinal displacement against the action of a helical compression return spring which is supported between the bottom of a housing container comprising a cylindrical body having a closed bottom to which a piston rod is firmly attached at its lower end, and the seat on the underside of said cylinder, the clip type reed spring supporting said piston relative to said piston rod in such a way that when pressure on the top side of the cylinder causes the dispensing of a portion, the piston is fixed to the piston rod, while during the end stroke of the cylinder the piston is fixed to the cylinder, and an abutment at the upper end of said cylindrical body limiting the return stroke of said cylinder, and in which the upper end of said piston rod is spaced beneath the top of the cylinder at a distance which is slightly greater than the downward stroke distance of the cylinder, a lip seal on said piston engaging said piston rod, said piston rod having a contracted section at a predetermined distance from its upper end, said contracted section having a length shorter than said predetermined distance, said predetermined distance in turn being greater than the distance from said lip seal to the zone of engagement of said clip type reed spring with said piston rod, and said length being slightly greater than the downward stroke distance of said cylinder.

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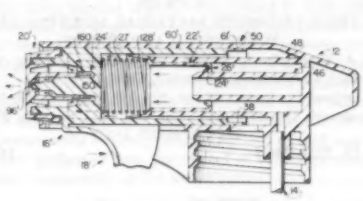
## PUMP DISPENSER WITH ADJUSTABLE NOZZLE

**Robert L. Bundschuh, 6534 Miami Lakes Dr. East, Miami Lakes, Fla. 33014**

**Filed Jul. 9, 1982, Ser. No. 396,832**

**Int. Cl.³ G01F *11/36***

**U.S. Cl. 222—321** **17 Claims**



11. In a pump dispenser having first means defining a fluid passageway, a dip tube extending from the fluid passageway into a container, second means for coupling the container to the first means, a vent formed in the first means and communicating with the interior of the container, an outboard one-way valve and an inboard one-way valve located along the fluid passageway and defining a product chamber therebetween, a finger engaging element coupled to the first means for movement from a first position to a second position to vary the volume of the product chamber, third means for biasing the finger engaging element from the second position to the first position, a nozzle member, and fourth means for coupling the nozzle member to the first means at the end of the fluid passageway, the improvement comprising:

said outboard one-way valve being formed by

an annular valve seat coupled to one of said nozzle member and said first means, and

an annular, resilient valve member formed integrally with the other of said nozzle member and said first means and engaging said valve seat,

said fourth means for coupling including means for preventing relative longitudinal movement of said nozzle member and said first means during opening and closing of the outboard one-way valve formed thereby,

said fourth means for coupling including means for adjustably coupling said nozzle member and said first means, said nozzle member and said first means having cooperating means for varying the flow of fluid to be exhausted via

said nozzle member upon adjusting the coupling of said nozzle member and said first means.

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## POURING NOZZLE AND INTERMEDIATE CONTAINER OF STRANG CASTING DEVICE

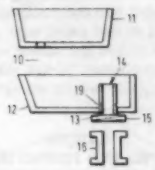
**Guenter Altland, Amselweg 3, 5750 Menden 2, Fed. Rep. of Germany**

**Filed Sep. 29, 1982, Ser. No. 427,271**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151533**

**Int. Cl.³ B22D *41/08***

**U.S. Cl. 222—597** **6 Claims**




1. An intermediate container of a strand casting device, comprising

a container part having a bottom with an opening;

a pouring nozzle of a refractory material, arranged in said opening of said bottom of said container part;

an elongating piece of a refractory material, associated with said pouring nozzle and extending into the interior of said container part; and

means forming a breakage point between said pouring nozzle and said elongating piece at a height of said bottom of said container part, said nozzle, said piece and said means together forming an uniterrupted integral element.

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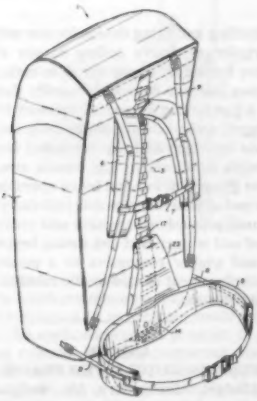
## BACK PACK

**Roy T. Opsal, Calgary, Canada, assignor to Canadian Mountaineering Equipment Ltd., Calgary, Canada**

**Filed Sep. 28, 1982, Ser. No. 425,639**

**Int. Cl.³ A*4*3F *3/10***

**U.S. Cl. 224—211** **5 Claims**



1. A back pack comprising:

a hip belt;

a pack bag;

an internal frame associated with the pack bag, said frame comprising a vertically directed stay extending centrally up the pack bag so as to substantially correspond in use with the spine of the user;

a flexible connector joining the central rear segment of the belt with the pack bag adjacent the lower terminus of the frame, said connector being operative to transmit load from the pack bag to the hip belt and to enable universal movement of said belt and frame relative to each other;

adjustable means for stabilizing the pack bag; and

a pair of shoulder straps, each interconnecting the central upper end portion of the pack bag with a lower corner portion thereof.

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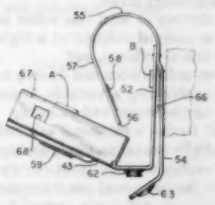
## CARRYING CASE FOR PORTABLE ELECTRONIC PAGING DEVICES

**Albert W. Swanson, 911 Simpson St., Evanston, Ill. 60201**

**Filed Jun. 20, 1983, Ser. No. 506,211**

**Int. Cl.³ A45C *11/00***

**U.S. Cl. 224—236** **4 Claims**




1. Carrying case for portable electronic paging devices, said devices of the type having a mounting clip attached thereto, and one or more controls or indicators positioned thereon, said carrying case comprising:

a front wall, a rear wall, first and second side walls, and a bottom assembled to define therewithin a first receptacle, open at its top, for closely receiving one said paging device;

means forming a second receptacle for receiving said mounting clip, said second receptacle-forming means including an outer wall member attached to and generally coextensive with the outer surface of said front wall and said second receptacle-forming means being positioned proximate said front wall to form with said first receptacle a partitioned receptacle assembly;

said outer wall including a generally vertically extending portion juxtaposed to and spaced-apart from said front wall with the remaining portion of said outer wall member joined to said front wall, said outer wall member and said front wall forming said second receptacle, open at its top, to receive said mounting clip;

a window formed in said front wall, said window being sized and shaped to positively engage the lowermost edge of said clip when said paging device is inserted into said first receptacle and said mounting clip is inserted into said second receptacle;

means for positively engaging said mounting clip to said carrying case when said mounting clip is received in said second receptacle;

means for attaching said carrying case to an article of clothing of a user; and

means for providing access to said controls or indicators without requiring removal of said carrying case from said user's clothing.

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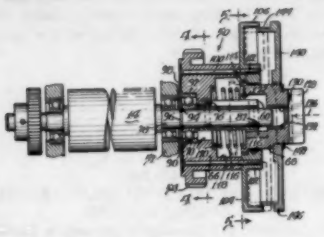
## BURSTER FOR CONTINUOUS FORM STATIONERY

Marland R. Johnson, Harvey, and Donald J. Naubeimer, Forest Park, both of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed Feb. 16, 1983, Ser. No. 466,814
Int. Cl.³ B65H 35/10
U.S. Cl. 225—100 10 Claims



5. A burster comprising

separated infeed and outfeed pairs of rollers spaced along a path of stationery travel,

means for driving at least one roller in each pair and for driving an outfeed roller(s) at a higher angular velocity than the infeed roller(s), and

means interposed between said driving means and said infeed roller(s) establishing a variable, limited lost motion connection therebetween, and including

(a) a shaft having a rotational axis and mounting a generally radially extending tooth, said tooth having opposed sides, each diverging from the radial on which said tooth is located as said axis is progressively approached, each said side defining a contact face;

(b) first and second stop members, each having an aperture aligned with said axis with said shaft extending therethrough,

(c) a radially directed stop on each said stop member and extending into the associated aperture, each said stop having at least one stop face for abutment over a substantial area with one of said contact faces and being arranged so as to be substantially parallel to said contact face during said abutment, said stop faces converging on the radial on which the associated stop is located as said axis is approached.

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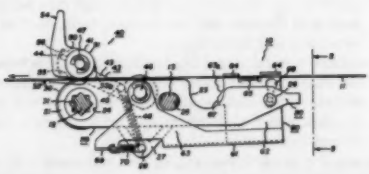
## FRICTION FEED TRACTOR

Werner H. Mailer, and Henry C. Sipe, both of Waynesboro, Va., assignors to Genicom Corporation, Waynesboro, Va.

Filed Aug. 5, 1982, Ser. No. 405,409
Int. Cl.³ B65H 17/38, 17/20; B41J 11/30, 11/34
U.S. Cl. 226—74 14 Claims



1. A friction feed tractor for moving paper along predetermined paper path and comprising:

a frame,

a rotatable drive roller carried by said frame,

a pressure roller mechanism rotatably carried by said frame and including a rotatable pressure roller and a rotatable carrier for said pressure roller,

said drive roller, said pressure roller and said carrier being rotatable about respecting different but parallel axes,

said pressure roller mechanism having a use position disposed on one side of the paper path to engage paper therein and a storage position disposed on the opposite side and out of the paper path,

a paper edge guide rotatably carried by said frame for guiding paper toward said drive roller, said paper edge guide having use and storage positions respectively also respectively disposed in and out of said paper path,

means for rotatably moving said carrier to move said pressure roller toward said drive roller when in said use position and for also rotatably moving said carrier to move said pressure roller into the storage position, and

cam means affixed to said paper edge guide and automatically responsive to said last named movement of the carrier to its storage position for also simultaneously moving said paper edge guide into its storage position.

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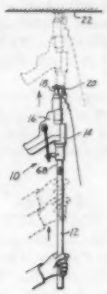
## POSITIONING AND FIRING DEVICE FOR EXPLOSIVE-ACTUATED TOOLS

James R. Conrad, 1631 Grandview, Glendale, Calif. 91201

Filed Sep. 30, 1982, Ser. No. 431,195
Int. Cl.³ B25C 1/10, 1/18
U.S. Cl. 227—9 13 Claims



1. A positioning and firing device for use with an explosive-actuated, trigger-responsive ceiling hanger clip installation tool operative by trigger displacement to embed in a ceiling a clip-supporting fastener carried forwardly thereby, said tool comprising a gun having a generally convex body, a laterally disposed trigger, and an axially displaceable outwardly spring-biased muzzle by which said clip-supported fastener is carried for presentation to a ceiling, said handle comprising a pole adapted to be grasped at one end by an operator and having at the opposite end a relatively movable tool-carrying cradle, said pole being axially translatable within said cradle for actuating movement of said trigger, and link means beyond said tool for displacing said trigger responsive to a predetermined axial translation displacement of said cradle relative to said pole in tool actuating relation.

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## APPARATUS FOR AUTOMATED FRAME ASSEMBLY

Boland R. Albright, Montgomery, Ala., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Feb. 19, 1982, Ser. No. 350,312
Int. Cl.³ B27F 7/02; B42B 3/00, 4/00; B42C 1/12
U.S. Cl. 227—48 10 Claims

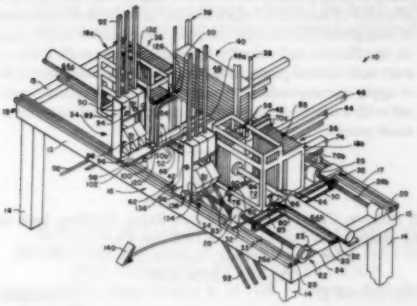
1. An apparatus for automated box-like frame assembly, the frames including a pair of opposed side portions and a pair of

opposed end portions, said portions having interengageable projections and slots along parallel sides thereof, said apparatus comprising:

means for supplying frame end portions, one at a time;

means for supplying frame side portions, one at a time;

means for holding a pair of said frame side portions in spaced apart relation ready for receiving a first frame end portion moved into engagement therewith;



reciprocating means for sliding said first end portions one at a time into engagement with said spaced apart pair of side portions and for sliding said engaged side portions and first end portion into engagement with a second end portion to complete a frame; and

means for driving fasteners to fix said side portions to said engaged end portions of a frame.

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## HYDRAULIC RIVET DRIVER

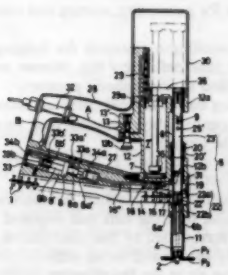
**Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Yokohama, Japan**

**Filed Sep. 6, 1983, Ser. No. 529,442**

**Claims priority, application Japan, Sep. 7, 1982, 57-154560**

**Int. Cl.³ B21J *15/02***

**U.S. Cl. 227—130** **3 Claims**



1. A rivet driver, comprising:

a main-body block containing a main cylinder,

a main piston adapted to reciprocate inside said main cylinder upon the application of the pressure of a fluid,

an actuating cylinder movably supported along the lateral side of said main-body block with the upper end thereof connected to the upper end of said main piston protruding from said main cylinder, provided in the longitudinal direction of the shell thereof with a slit, and adapted to reciprocate in conjunction with said main piston,

a chuck formed at the lower end of said actuating cylinder and adapted to nip the flange of a rivet or the portion of a shank of said rivet protruding upwardly from said flange,

a hammer lever accommodated within said actuating cylinder to reciprocate in conjunction with said actuating cylinder and adapted to have the lower end thereof deliver a downward stroke upon the male shank of the rivet nipped by said chuck,

a spring contained within said actuating cylinder and positioned between the upper end of said hammer lever and the upper end of said actuating cylinder,

a pin formed on the lateral surface of said hammer lever and projecting from said slit in said actuating cylinder,

a striker adapted to allow the upward passage of said pin during the ascent of said hammer lever and said actuating cylinder but catch said pin and interrupt the descent of said hammer lever during the descent of said actuating cylinder together with said hammer lever thereby to cause the upper end of said actuating cylinder to contract said spring on the upper end of said pin,

a piston for drawing said striker back from the position at which said striker catches said pin,

an operating valve for actuating said piston by the pressure of a fluid, and

a feed piston adapted to be actuated by the pressure of a fluid, upon completion of said ascent of said actuating cylinder, to urge the frontmost of a plurality of rivets arranged in a row to a position below said chuck at the lower end of said actuating cylinder.

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## APPARATUS FOR THE MANUFACTURE OF HOLLOW CYLINDRICAL BODIES

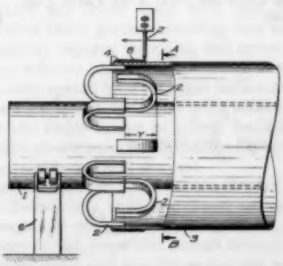
**José Fernandez; Jürgen Herm; Heinz Krakow; Harald Tomsen, all of Hamburg, Fed. Rep. of Germany, and Ernst Wortmann, deceased, late of Hamburg, Fed. Rep. of Germany (by Elfriede Wortmann, legal representative), assignors to Thyssen Stahl Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany**

**Filed Aug. 4, 1981, Ser. No. 289,848**

**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029686**

**Int. Cl.³ B23K *9/04, 37/04***

**U.S. Cl. 228—48** **3 Claims**



1. An apparatus for the manufacture of hollow cylindrical bodies by deposit welding comprising a supporting body rotatably mounted on bearings at both ends thereof, a plurality of circumferentially and radially extending U-shaped spring elements periphery of said supporting body, the legs of which elements are parallel to the axis of the supporting body, said U-shaped spring elements being adaptable to engage a hollow cylindrical basic body concentrically disposed to said supporting body, said apparatus further including a welding means positioned relative to said supporting body to deposit welding material on the outer surface of any hollow cylindrical basic body engaged by said U-shaped spring elements.

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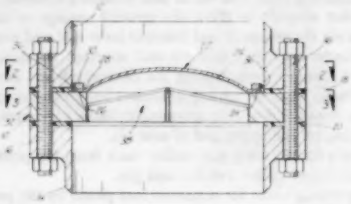
## REVERSE BUCKLING RUPTURE DISK ASSEMBLY METHOD

**Michael C. Finnegan, Limerick, Ireland, assignor to BS&B Safety Systems, Inc., Tulsa, Okla.**

**Division of Ser. No. 343,413, Jan. 28, 1982, Pat. No. 4,431,018. This application Nov. 2, 1983, Ser. No. 547,991**

**Int. Cl.³ B23K *31/02***

**U.S. Cl. 228—155** **6 Claims**



1. A method of manufacturing a reverse buckling rupture disk apparatus adapted to be clamped between inlet and outlet companion bolted flanges, the operation of said apparatus being unaffected by the torque applied to the bolts of the companion flanges comprising the steps of:

welding a reverse buckling rupture disk having a concave-convex portion and an annular flange portion to an annular support ring positioned adjacent the annular flange portion of said rupture disk on the convex side thereof, said welding being carried out at the periphery of said annular flange portion of said rupture disk using a low heat welding technique; and

welding said support ring having said rupture disk welded thereto to an annular support member adapted to be clamped between said companion bolted flanges, said support member being positioned adjacent the annular flange portion of said rupture disk on the opposite side thereof from said support ring.

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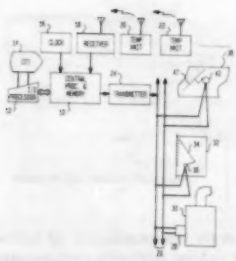
## ZONED CONTROL SYSTEM

**Robert S. Didner, 29 Skyline Dr., Morristown, N.J. 07960**

**Filed Dec. 30, 1982, Ser. No. 454,834**

**Int. Cl.³ F24F *7/00, 3/00;* F23M *5/20***

**U.S. Cl. 236—49** **18 Claims**



1. In a thermal system having a central plant feeding a plurality of adjustable zone regulators for bringing their respective zones to corresponding target temperatures, a controller comprising:

a plurality of temperature sensors distributed one to a zone, each of said sensors being operable to produce a zone signal signifying zone temperature;

a plurality of zone actuators, each having a zone control terminal and each, in response to a signal at its zone control terminal, being operable to adjust a corresponding one of said zone regulators; and

a control means coupled to each of the temperature sensors and to the zone control terminal of each of said zone actuators for calculating the zone temperature errors with respect to their respective target temperatures and for starting said central plant response to a predetermined function of the cumulative zone temperature errors exceeding a given limit, each of said zone temperature errors being at least producible at above said given limit and at a plurality of non-zero values smaller in magnitude than that of said given limit so that the zone temperature errors may be insufficient individually but sufficient cumulatively to start said central plant, said control means being operable to apply corresponding signals to each zone control terminal with a timing determined by its corresponding temperature error.

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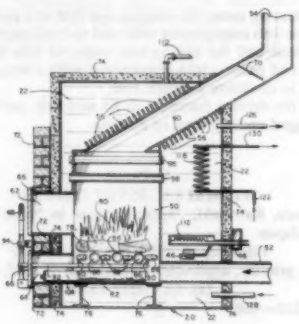
## HEATING SYSTEM

**Keith Billotte, Clearfield, and Patrick Shive, Drifting, both of Pa., assignors to Patrick Shive, Drifting, Pa.**

**Filed Apr. 23, 1981, Ser. No. 256,787**

**Int. Cl.³ F24D *3/00***

**U.S. Cl. 237—8 R** **14 Claims**



1. A system for generating, storing and releasing heat, comprising:

a tank surrounding a reservoir for holding a heat transfer fluid, the tank defining a top, bottom and side, the tank being vented to atmospheric pressure;

heat releasing means in fluid communication with the reservoir for controllably releasing heat from the fluid to a space to be heated;

means for regulating flow of the fluid between the reservoir and the heat releasing means;

a heat conductive fire chamber, the chamber being substantially smaller than the tank and disposed within the reservoir and surrounded by the reservoir on all sides

an air supply means and an air exhaust means for carrying combustion air to the fire chamber and for carrying away hot exhaust gases;

an access passageway for access to the fire chamber, the access passageway connecting the fire chamber to the side of the tank;

a support spacing the fire chamber from the bottom of the tank, the fire chamber being securely attached to the same and centrally positioned within the tank, by the support, the access passageway and the air supply and exhaust means;

a plurality of spaced hollow boiler tubes disposed horizontally in the fire chamber and open to the reservoir at both ends thereof, the boiler tubes being parallel to one another;

a plurality of flat shaker grids disposed between and immedi-

ately adjacent the boiler tubes, the grids being pivotally attached to the fire chamber and individually rotatable on axes parallel to said hollow boiler tubes, the grids and boiler tubes together being operable to support burning fuel within the fire chamber and in contact with the boiler tubes; and,

a linkage attached to the shaker grids, the linkage being operable to rotate the shaker grids about their axes, the linkage having a portion extending beyond the tank connected to an actuation means, whereby the fuel is agitated and ash is removed from the fuel in contact with the boiler tubes.

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**4,479,606**

## REMOTE STEAM SYSTEM HAVING COMMON RECIRCULATION OF CONDENSATE AND METHOD FOR CONDENSATE RECIRCULATION

**Helmut Bälz, Koepffstrasse 5, D-7100 Heilbronn, Fed. Rep. of Germany**

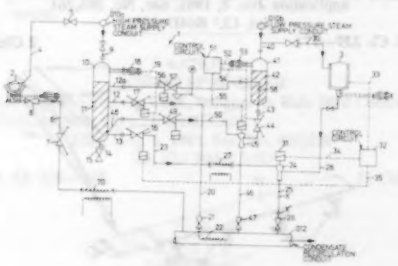
**PCT No. PCT/DE81/00150, § 371 Date May 19, 1982, § 102(e) Date May 19, 1982, PCT Pub. No. WO82/01237, PCT Pub. Date Apr. 15, 1982**

**PCT Filed Sep. 21, 1981, Ser. No. 385,394**

**Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037293**

**Int. Cl.³ F24D *1/02***

**U.S. Cl. 237—67** **15 Claims**



7. A steam supply system for common condensate recirculation of at least two condensate flows from at least one source (**3**, **28**; **41**, **43**, **44**) of low pressure condensate, which flows are at different pressures and different temperatures, said system having (**3**, **42**) a common condensate recirculation conduit (**012**) in which a pressure above that of at least one of the condensate flows pertains, and having a high-pressure steam supply conduit (**012***a*);

and comprising

a pumping device (**24**) consisting of a jet pump coupled to and solely driven by the condensate flow having the higher pressure and connected for pumping of the condensate flow having the lower pressure into the condensate recirculation conduit (**012**), said jet pump being the sole pumping device for condensate flow having the lower pressure;

and a mixing device (**24**) coupled to the higher pressure and the lower pressure condensate flows in which the pumped condensate flows are mixed, located in the paths of the condensated flows and

ahead of the entrance of said condensate flows into the condensate recirculation conduit (**012**).

**4,479,607**

## RAIL FASTENING DEVICE

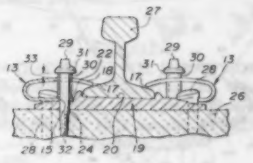
**Shuichi Okumura, Kamakura, and Yutaka Satoh, Tama, both of Japan, assignors to Toyo Kizai Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 8, 1982, Ser. No. 396,527**

**Claims priority, application Japan, Apr. 21, 1982, 57-56959[U]**

**Int. Cl.³ E01B *9/48***

**U.S. Cl. 238—349** **5 Claims**




1. In a rail fastening device for securing a railway rail having a base flange to a railway sleeper, the improvement which comprises: said fastening device comprises a tie plate laid between said sleeper and said base flange of said rail, said tie plate having an upper surface and having laterally spaced-apart screw spike holes disposed on opposite lateral sides of said base flange of said rail;

a leaf spring associated with each of said screw spike holes, said leaf spring being reversely bent between its ends to form a lower leg and an upper leg which are opposed to and are vertically spaced from each other, said lower leg of said leaf spring bearing on said upper surface of said tie plate and having an aperture therethrough which aperture is in registry with its associated screw spike hole in said tie plate, said upper leg of said leaf spring having a free end which engages said base flange of said rail and resiliently presses said rail against said tie plate, said upper leg having an elongated slot extending lengthwise from said free end thereof to a location above said screw spike hole and said aperture;

a screw spike associated with each of said leaf springs and said screw spike holes, each said screw spike having a stem extending downwardly through its associated slot, aperture and screw spike hole, said stem having a threaded lower portion extending into said sleeper and threadedly engaged therewith, said screw spike having a flange adjacent to its upper end which flange is vertically upwardly spaced from the upper surface of said upper leg of said leaf spring, said flange being wider than said slot so that said flange cannot be moved through said slot, the portion of said stem that extends through said slot being of lesser width than said slot; and

a spacer on said stem of said screw spike, said spacer extending downwardly from said flange of said screw spike through said slot in said upper leg of said leaf spring, the portion of said spacer that extends through said slot being of lesser width than said slot so that said upper leg of said leaf spring can move upwardly and downwardly with respect to said spacer and said stem, the lower end of said spacer bearing against the upper surface of said lower leg of said leaf spring adjacent to said aperture and pressing said lower leg of said leaf spring against said tie plate, the length of said spacer being such that the upper end of said spacer projects above the upper side of said elongated slot whereby said flange on said screw spike is spaced upwardly from and does not bear against the upper surface of said upper leg of said leaf spring and the entirety of said upper leg of said leaf spring is free to flex upwardly and downwardly relative to said screw spike.

**4,479,608**

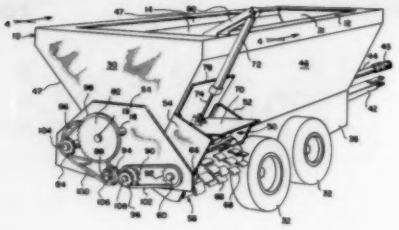
## MANURE SPREADER

**Mervin G. Martin, Myerstown, Pa., assignor to Hedlund Manufacturing Co., Inc., Boyceville, Wis.**

**Continuation of Ser. No. 170,034, Jul. 18, 1980, abandoned. This application Jul. 13, 1983, Ser. No. 512,946**

**Int. Cl.³ A01C *23/00***

**U.S. Cl. 239—7** **36 Claims**



**26.** An apparatus for spreading liquid or semiliquid manures comprising:

a container for holding manure to be spread;

a spinner attached to said apparatus for spreading liquid or semi-liquid manures, said spinner having a plurality of blades having an outer peripheral edge for shredding and spreading manure;

means located in said container for moving manure within said container to a position where the manure can be spread, said means operable for directing the manure onto said outer peripheral edge of said blades to thereby permit said blades to engage the manure flowing from said container; and

drive means for rotating said spinner at sufficiently high velocity so that when manure is moved from in said container into said spinner said spinner is operable for lifting said manure upward for expelling the manure over said spinner to produce a spray pattern of manure on a field.

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**4,479,609**

## LIQUID SPRAYER

**Masatoshi Maeda; Tomohiro Kami; Toshio Kusunoki, and Yukio Yamamura, all of Shiga, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

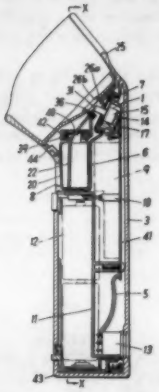
**Filed Sep. 10, 1982, Ser. No. 416,607**

**Claims priority, application Japan, Oct. 9, 1981, 56-161169**

**Int. Cl.³ B05B *1/26***

**U.S. Cl. 239—102** **3 Claims**

**1.** A liquid sprayer comprising a casing having a support portion, an ultrasonic vibrator carried by said casing, a liquid supply chamber and a liquid absorber for absorbing liquid from said liquid supply chamber and feeding it to said ultrasonic vibrator, said liquid absorber being formed of a core material having liquid absorption properties, said core material being covered lengthwise with extending protector plates, said protector plates being secured to each other partially through said core material to increase the value of resistance against liquid current flowing through said liquid absorber, said core abutting against the lateral side of the utmost end of said ultrasonic vibrator in the vibration direction thereof and projecting outwardly of the utmost end of said ultrasonic vibrator, said liquid



absorber being supported at the partially fixed portion of said protector plates by said support portion.

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**4,479,610**

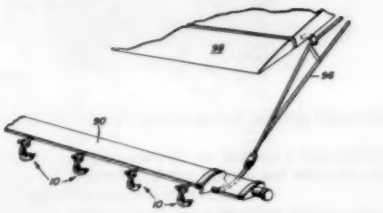
## PIVOT VALVE FOR CROP SPRAYING EQUIPMENT

**Robert E. Etheridge, P.O. Box 5421, Greenville, Miss. 38701, and Philip L. Lewis, Rte. 1, Box 71-A, Glen Allan, Miss. 38744**

**Continuation of Ser. No. 123,185, Feb. 5, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,261**

**Int. Cl.³ B64D *1/18***

**U.S. Cl. 239—171** **2 Claims**



**1.** A pivot valve for crop spraying equipment comprising:

housing means formed in two relatively movable parts and having an interior fluid retaining chamber;

fluid connection means in fluid communication with said interior chamber formed in said housing means and being operably connectible to a fluid supply means, so as to permit a supply of fluid to be directed from said fluid supply means into said chamber;

fluid discharge means operably connected to one of said two parts of said housing means and being in selective fluid communication with said chamber, said discharge means serving as a means whereby said fluid may be selectively discharged from said chamber;

valve control means positioned proximate to said chamber and serving to control a release of said fluid into said fluid discharge means in response to a selective pressurization of said fluid; and

discharge direction control means for controlling a direction of discharge of said fluid from said fluid discharge means, said discharge direction control means including locking means opoerably joining said two parts of said housing

means together, said locking means when in a released condition serving to permit relative movement between said two parts, whereby a selective angular orientation of said fluid discharge means can be achieved to thus control said direction of said fluid discharge, and when in a locked condition serving to prevent relative movement between said two parts to thus prevent any further change in said fluid direction, said locking means including a threaded member extending between said two parts and being operable, when tightened, to draw said two parts into a tight abutting relationship thereby to prevent said relative movement therebetween, one of said parts of the housing means including a tubular sleeve integral therewith and closely surrounding said threaded member and extending toward said fluid retaining chamber, said valve control means including a spring biased valve member having a centrally located aperture slidably received on and guided by the tubular sleeve, said valve member being positioned within an orifice in fluid communication with said fluid retaining chamber, said orifice being formed in the other of said two parts of said housing means, said valve member being retained in position within said orifice by said spring to facilitate fluid movement past the valve member only when a predetermined fluid pressure has been attained in the fluid chamber, said orifice receiving the threaded member extending between the two parts of the housing means, said valve member and spring being disposed on the tubular sleeve with the spring having one end engaging the housing means and the other end engaging the valve member for biasing the valve member axially of the tubular sleeve and threaded member, said orifice including a valve seat engaged by the valve member with the spring holding the valve member in closed relation to the valve seat until fluid pressure overcomes the spring, said valve seat and valve member being concentric with respect to the threaded member which also forms the pivotal connection between the two parts of the housing means.

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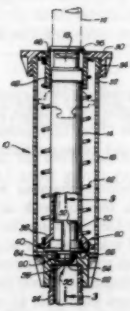
**4,479,611**

## POP-UP SPRINKLER

**Oscar Galvis, LaVerne, Calif., assignor to Rain Bird Consumer Products Mfg. Corp., Durate, Calif.**

**Filed Aug. 6, 1982, Ser. No. 406,028**
**Int. Cl.³ B05B *3/00***
**U.S. Cl. 239—205** **21 Claims**



1. A pop-up sprinkler, comprising:

a sprinkler housing having a bottom end wall with a relatively small inlet port formed therein for flow of water into said housing, said sprinkler housing further including an annular flange surrounding said inlet port and upstanding from said bottom end wall with a substantially uniform cross-sectional thickness for at least a substantial portion of its height, the inner diameter surface of said flange defining an annular valve seat, said housing and said flange cooperating to define an upwardly open annular recess formed about the exterior of said flange;

a pop-up stem carried within said housing for movement between a retracted position withdrawn substantially into said housing and a spraying position projecting outwardly from said housing; and

a control valve for preventing water flow into said housing when said stem is in the retracted position, said control valve including a relatively small valve plug carried by said stem and a seal ring carried by said valve plug for sealing engagement with said valve seat when said stem is in the retracted position.

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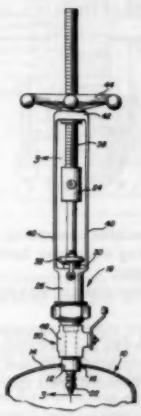
**4,479,612**

## RETRACTABLE GLYCOL SPRAY NOZZLE

**Newell L. Umbach, 668 Longview, Douglas, Wyo. 82633, and William J. Boyer, 3751 E. 19th, Casper, Wyo. 82601**

**Filed Sep. 28, 1982, Ser. No. 427,527**
**Int. Cl.³ B05B *13/06***
**U.S. Cl. 239—280** **2 Claims**



1. In combination with a closed vessel subject to internal pressure and including a wall portion through which a tubular fitting is sealingly secured, said fitting including opposite ends opening inwardly and outwardly, respectively, of said vessel, a retractable spray nozzle assembly, said assembly including a full opening and full closing valve defining a straight passage therethrough when said valve is fully opened, said valve being mounted from the outwardly opening end of said fitting with the latter co-extensive with said passage, a tubular mounting sleeve having one end mounted from said valve coaxial with the end of said passage remote from said fitting, diametrically opposite portions of said sleeve on the end thereof remote from said valve including a pair of elongated endwise outwardly projecting laterally spaced apart arms, a journal portion extending and connected between the ends of said arms remote from said sleeve, a hand wheel journaled from said journal portion against axial shifting relative thereto, an elongated jack screw threaded centrally through said hand wheel and including a first end disposed between said arms, facing toward said sleeve and co-axial therewith, a right-angle hollow fitting mounted on said one end of said jack screw including a first lateral port opening outwardly between said arms and a second port opening toward said sleeve and co-axial therewith, an elongated tubular wand having a first end portion rigidly and sealingly connected to said fitting about said second port and a second end portion, having a spray nozzle mounted thereon, slidingly received through said sleeve and projectable through and retractable from said passage, said sleeve including seal means establishing a sliding fluid tight seal between said wand

and said sleeve, said first lateral port including an inlet fitting sealingly secured thereto and projecting outwardly between said arms.

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**4,479,613**

## PULVERIZING MACHINES

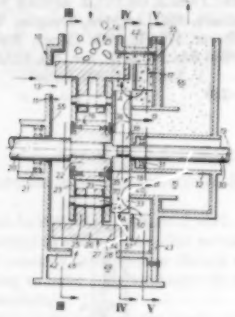
**Bernard J. Rowledge, West Midlands, England, assignor to Sardon International Limited, England**

**Filed Nov. 4, 1981, Ser. No. 318,291**

**Claims priority, application United Kingdom, Nov. 1, 1980, 8035214**

**Int. Cl.³ B02C *23/32, 23/34***

**U.S. Cl. 241—48** **9 Claims**



1. A pulverizing machine comprising:

(a) a housing defining a chamber having an air inlet means and an outlet means,

(b) means to introduce material into the chamber for pulverizing,

(c) a pulverizer rotor member mounted within the chamber to rotate about an axis and including a plurality of pulverizer members peripherally disposed thereon,

(d) conveyor means spaced apart from one side of said pulverizer rotor member,

(e) said conveyor means including guide means, and

(f) classifier means located adjacent said one side of the pulverizer rotor member,

(g) said housing and pulverizer rotor member being disposed with respect to each other to define an annular reducing zone in said chamber and around the rotor member, and into which reducing zone the pulverizer members project to cause material to be pulverized in said reducing zone and to impart a rotation to the flow of air and material in said reducing zone,

(h) said housing, conveyor means and guide means being disposed with respect to each other to define an annular conveyor zone in said chamber,

(i) said conveyor zone having a radially outer portion which is alongside and is open toward said reducing zone to admit a rotating flow of pulverized material and air to pass in a first axial direction into said conveyor means and said conveyor zone,

(j) said conveyor zone having an intermediate portion disposed radially inward of and surrounded peripherally by said outer portion of the conveyor zone,

(k) the guide means comprising guide members defining a plurality of partial spiral conveyor paths in said intermediate portion to convey said flow of air and pulverized material spirally inward toward said axis,

(l) said conveyor zone having a radially inner portion disposed radially inwards of and peripherally surrounded by said intermediate portion to accept said rotating flow of air and pulverized material from said guide means,

(m) the classifier means comprises a cylindrical classifier zone disposed around said axis in said chamber and adjacent to and co-axial with the rotor so as to lie between said one side of the rotor member and said inner portion of the conveyor zone,

(n) said conveyor means, classifier means and outlet being arranged with respect to each other so that said inner portion of the conveyor zone lies around a cylindrical wall of the outlet, said cylindrical wall being open toward the classifier zone and said inner portion of said conveyor zone being arranged to turn said rotating flow of air and pulverized material to move, while rotating about said axis, in an axial direction opposite to said first axial direction so as to enter the side of the classifier zone remote from said one side of the rotor member,

(o) said classifier zone being co-axial with and peripherally surrounded by an outer portion of said reducing zone,

(p) at least one of the pulverizer members having an extension section which extends in said first direction across the periphery of the classifier zone toward said conveyor means so that oversize material from said flow of air and pulverized material entering the classifier zone has a path which extends substantially radially outwardly back to said outer portion of said reducing zone, and smaller material from said flow of air and pulverized material has a path which extends substantially radially inwardly to said outlet, both said paths being separate from the flow of said pulverized material to the classifier zone.

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**4,479,614**

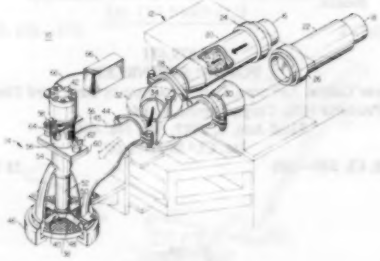
## VARIABLE SPEED MEAT GRINDER

**Vincent E. Bernard, 23301 Bocana, Malibu, Calif. 90265**

**Filed Apr. 14, 1983, Ser. No. 484,903**

**Int. Cl.³ B02C *18/30***

**U.S. Cl. 241—82.2** **3 Claims**



1. An apparatus for grinding meat particles, comprising:

a pump having a variable feed rate for feeding meat particles in a continuous flow under high pressure and at a selected feed rate that remains constant throughout the pumping operation;

a frusto-conical collection chamber having a right angle bend in the middle thereof with an inlet port disposed adjacent said pump for receiving the output of said pump into the interior of said chamber and an outlet port disposed at right angles to said inlet port at the other end of said chamber, the diameter of said outlet port larger than that of said inlet port such that an expanding volume is provided for meat particles pumped from said pump;

a grinder plate disposed over said outlet port of said collection chamber with a plurality of orifices disposed therein for reducing the particulate size of the meat particles as the meat particles are pressed therethrough from said collection chamber by said pump;

a plurality of planar cutting blades rotatable about an axis perpendicular to said grinder plate and extending radially therefrom, said blades rotating in a plane parallel to said grinder plate such that said blade moves perpendicular to

the orifices in said grinder plate to reduce the length of the meat particles output from said grinder plate;

a rotating shaft disposed along the rotational axis of said blades and attached at one end to the rotational center of said blades, said rotating shaft passing through said collection chamber to the exterior thereof; and

a variable speed hydraulic motor attached to the other end of said rotating shaft for rotation thereof to thus control the rotational speed of said blades such that the length of the meat particles output from said grinder plate is varied to a desired particulate length, said hydraulic motor powered by a hydraulic pump.

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**4,479,615**

**ROLL SHEET SUPPLYING MECHANISM FOR A RECORDING DEVICE**

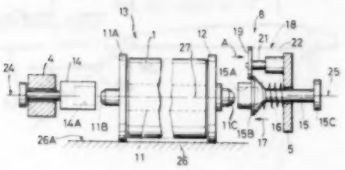
**Hisao Nakajima, and Svay Leng, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Jul. 9, 1982, Ser. No. 396,948**

**Claims priority, application Japan, Jul. 24, 1981, 56-115324**

**Int. Cl.³ B65H *19/02***

**U.S. Cl. 242—68.4** **3 Claims**



1. A roll support mechanism for a recording device comprising a roll, a shaft for supporting said roll with the ends of the shaft extending outwardly beyond said roll, a first shaft supporting member having a fixed end portion for supporting one end of said shaft, a second shaft supporting member having a moveable end portion for supporting the other end of said shaft, biasing means for biasing said moveable end portion toward said shaft, a locking mechanism engageable with said moveable end portion to hold said moveable end portion against the bias of said biasing means a sufficient distance from said fixed end portion to permit changing of said roll, and support means for supporting said roll intermediate said first and second supporting members only during loading of said roll with the ends of the shaft substantially aligned with said fixed end portion and said moveable end portion respectively.

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**4,479,616**

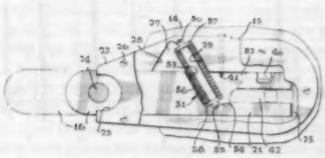
**EXTENDABLE CRANK HANDLE**

**Oscar Kovalovsky, 11154 Debby St., North Hollywood, Calif. 91606**

**Filed Jul. 13, 1981, Ser. No. 282,410**

**Int. Cl.³ A01K *89/00*; G05G *1/00***

**U.S. Cl. 242—84.1 J** **5 Claims**



1. An extendable crank handle for driving the spool of a fishing reel comprising the combination of:

an elongated body having a channel provided therein open at one end and closed at its opposite end;

a slide bar movably carried on said body in said channel having a portion thereof outwardly projecting from said body having said channel open end;

a finger-grasping member rotatably mounted on said slide bar portion projecting from said body;

said slide bar having an extended position which increases the throw of crank movement and a retracted position which decreases the throw of crank movement;

means operably connected between said body and slide bar for yieldably retaining said slide bar in either of its alternate positions; and

said retaining means is an over-center toggle mechanism pivotably carried at its opposite ends on said body and said slide bar respectively.

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**4,479,617**

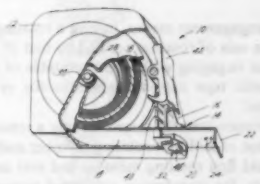
**TAPE MEASURE CONSTRUCTION INCORPORATING A MODIFIED TAPE HOOK BUMPER**

**Richard L. Edwards, Cary, N.C., assignor to Cooper Industries, Inc., Houston, Tex.**

**Filed Oct. 13, 1982, Ser. No. 434,145**

**Int. Cl.³ B65H *75/48***

**U.S. Cl. 242—107** **14 Claims**



1. A measuring tape construction, comprising:

a. a casing having a front wall and an opening in said front wall;

b. a tapeline coiled within said casing, said tapeline having a first end extending from said casing front wall opening;

c. a tape retaining hook attached to said tapeline first end;

d. retracting means for retracting said tapeline into said casing except for said tape retaining hook; and

e. a resilient, deformable bumper mounted with said casing adjacent said opening in the path of said tape retaining hook to prevent said hook from slamming against said casing, said bumper comprising:

(1) a main body portion and

(2) a tape retaining hook engaging portion formed with said main body portion defining an aperture between said engaging portion and said pody portion, said tape retaining hook engaging portion having a convex surface for contacting the tape retaining hook,

whereby said tape retaining hook engaging portion bends to cushion the impact of said hook striking said engaging portion following retraction.

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**4,479,618**

**TAPE CASSETTE ADAPTER**

**Takehiro Okada, Neyagawa; Masataka Izaki, Yawata; Jirou Kajino, Neyagawa, and Toshibumi Kamiyama, Tsuyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 8, 1982, Ser. No. 447,898**

**Claims priority, application Japan, Dec. 14, 1981, 56-202198**

**Int. Cl.³ G03B *1/04*; G11B *15/32***

**U.S. Cl. 242—200** **20 Claims**

4. A tape cassette adapter for a magnetic tape recording and/or reproducing apparatus comprising:

a cassette positioning means provided on a plate for positioning a compact tape cassette, having a shorter length tape wound on a supply reel and a take-up reel, and being

smaller in size and lighter in weight than standard size tape cassettes;

a reel gear provided on the take-up reel;

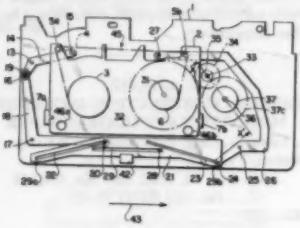
a sub-plate parallel to said plate;

a first shaft provided on the sub-plate;

a middle gear which rotates on the first shaft and engages with the reel gear;

a second shaft provided on the sub-plate;

a reel drive gear which rotates on the second shaft and engages with said middle gear;



an engagement means, having a rotating member which has an axis of rotation parallel to that of said reel drive gear, for engaging with a reel turntable of a standard size magnetic tape cassette apparatus for synchronous rotation; and

a rotation transfer means, having a rotational axis parallel to that of said first rotating member and positioned between said first rotating member and said second rotating member, for transferring rotational power from said engagement means to said reel drive gear;

wherein said plate has a bore means for locating said first shaft provided on said sub-plate.

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**4,479,619**

## HELICOPTER TRANSMISSION SYSTEMS

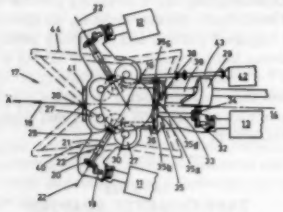
**James E. Saunders, and Brian A. Shotter, both of Sherborne, England, assignors to Westland plc, Yeovil, England**

**Filed Mar. 29, 1983, Ser. No. 479,992**

**Claims priority, application United Kingdom, Apr. 8, 1982, 8210539**

**Int. Cl.³ B64C *27/14*; B64D *35/08***

**U.S. Cl. 244—60** **11 Claims**



1. A helicopter transmission system for operatively connecting three engines to a main sustaining rotor, and including two output channels connected respectively to two of the engines, dividing means dividing each output channel so as to drive two output pinions meshed with a common combining gear rotationally fixed to a sustaining rotor drive shaft, and a combining gear train providing an input for the third engine and serving to distribute power from all three engines to both output channels and to balance torque transmitted by the two output channels.

**4,479,620**

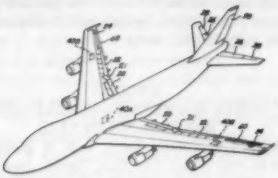
## WING LOAD ALLEVIATION SYSTEM USING TABBED AILERONS

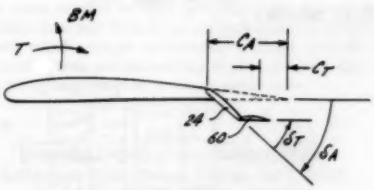
**John T. Rogers, and Kenneth J. R. Manning, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.**

**Continuation of Ser. No. 923,940, Jul. 13, 1978, abandoned. This application Oct. 3, 1983, Ser. No. 537,557**

**Int. Cl.³ B64C *9/10***

**U.S. Cl. 244—75 R** **6 Claims**






1. In an aircraft having a hydraulically actuated wing load alleviation system wherein the outboard ailerons on each of the wings are symmetrically deflected to reduce increased aircraft wing loads caused by gusts and pilot-induced maneuvers occurring during flight, an improvement in the method of wing load alleviation comprising the additional step of deflecting a trailing edge tab pivotally supported on each said outboard aileron in aerodynamic opposition to the deflection of its associated outboard aileron so as to reduce wing torsional loads.

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**4,479,621**

## FLOOR CONSTRUCTION FOR THE UPPER COMPARTMENT OF AN AIRCRAFT

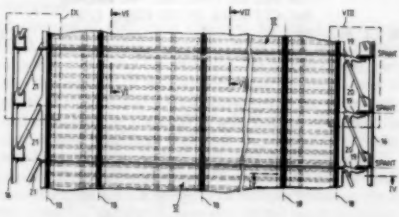
**Helmut Bergholz, Byandung/Indonesien, Fed. Rep. of Germany, assignor to Messerschmitt-BUMO/o/ Ikow-Blohm G.m.b.H., Munich, Fed. Rep. of Germany**

**Filed Oct. 20, 1982, Ser. No. 435,417**

**Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141869**

**Int. Cl.³ B64C *1/18***

**U.S. Cl. 244—117 R** **21 Claims**



1. A floor construction for the upper compartment of an aircraft having an about circular fuselage cross-section comprising

a one piece floor plate providing bending supports and

extensing over nearly the full inner diameter of the fuselage;

a connection provided between the edge of the floor plate and the fuselage outer structure for transmitting forces directed predominantly in the longitudinal direction of the air craft and substantially eliminating transversely directed forces through the floor structure; and

vertically running planar structural members providing side support elements for the floor plate.

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4,479,622

## AIRCRAFT DOOR ARRANGEMENTS

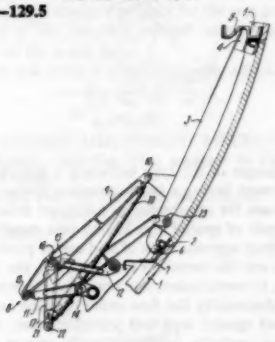
Eric R. W. Howse, Christchurch, England, assignor to British Aerospace Public Limited Company, London, England

Filed Feb. 15, 1983, Ser. No. 466,476

Claims priority, application United Kingdom, Feb. 19, 1982, 8204916

Int. Cl.³ B64C 1/14

U.S. Cl. 244—129.5 5 Claims



1. An aircraft door arrangement, comprising:

a pressure hull structure defining a door aperture;

a door sized and shaped to lie within the aperture when closed but able to pass therethrough when opened;

oppositely spaced edge regions on the door;

matching abutment regions on the hull structure of the aperture, said regions arranged to engage one another to prevent passage of the door through the aperture when in the closed position;

carrier means pivotally anchored to the hull structure and carrying the door; and

actuation means pivotally anchored to the hull structure and to the door, the carrier means and the actuation means cooperating with the door such that, in an opening sequence, the door firstly moves to clear the abutment regions and subsequently moves bodily through the aperture to an open position;wherein

the carrier means comprises an arm pivoted at one end to the door and pivotally supported in the region of its other end by twin radius rods having their ends pivoted to the arm at spaced points and having their other ends pivoted to the hull structure at similarly spaced points; and wherein

the actuation means comprises a crank rotatably carried at one end by the hull structure, and said crank pivotally carrying at another end of two push-pull rods, the further ends of these two rods being pivotally connected to the door at spaced points.

4,479,623

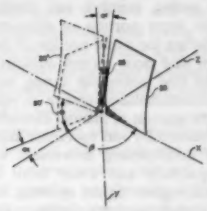
## SPRING OPERATED COUNTERBALANCE HINGE ASSEMBLY FOR AIRCRAFT DOORS

Alex Maraghe, Seattle, and Allan W. Opsahl, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 10, 1982, Ser. No. 448,720

Int. Cl.³ B64C 1/14

U.S. Cl. 244—129.5 12 Claims



1. In combination with an aircraft door of the type adapted to be shifted outwardly and inwardly to open and close an ingress/egress opening in the aircraft fuselage during door opening and closing operations, respectively, about a generally vertical but inwardly canted hinge axis defined by a torque tube mounted in said fuselage with freedom for rotation about said axis and drivingly coupled to said door by hinge link defining means, and wherein said door is required to move upwardly during the initial portion of both door opening movement and door closing movement as a direct result of pivotal door movement about said generally vertical inwardly canted hinge axis, the improvement comprising a spring operated door counterbalance hinge assembly comprising:

(a) a first convolute clock-type spring member having its outer free end rigidly secured to said fuselage and its convolutions coaxially wrapped about said torque tube in a first direction;

(b) a second convolute clock-type spring member having its outer free end rigidly secured to said fuselage and its convolutions coaxially wrapped about said torque tube in a second direction opposite to said first direction; and,

(c) first and second radially projecting shoulder means formed on said torque tube and respectively separably engageable with the inner free ends of said first and second convolute spring members, said first and second shoulder means being positioned with respect to said first and second convolute spring members so that said first shoulder means engages the inner free end of said first convolute spring member during the latter portion of door-closing movement when said door is moving into

said ingress/egress opening in said fuselage for winding said first convolute spring member and storing energy therein during said latter portion of door-closing movement and so that said second shoulder means engages the inner free end of said second convolute spring member during the latter portion of door-opening movement when said door is moving away from said ingress/egress opening in said fuselage for winding energy in said second convolute spring member and storing energy therein during said latter portion of door-opening movement, whereby during the initial portion of door-opening movement when said door moves outwardly and upwardly, said wound first convolute spring member unwinds to impart a counterbalance torque to said torque tube for reducing the amount of manual exertion required to pivot said door outwardly and upwardly and, during the initial portion of door-closing movement when said door is moving upwardly and away from said fuselage and towards said ingress/egress opening, said wound second convolute spring member unwinds to impart a counterbalance torque to said torque tube for reducing the amount of manual exertion required to pull said door upwardly and away from said fuselage and towards said ingress/egress opening.

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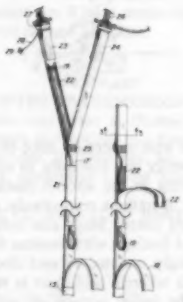
**4,479,624**

## PARACHUTE RISER ASSEMBLY

**Michael A. Martin; Bruce W. Trenholm, and James G. Woolley, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 23, 1982, Ser. No. 410,283**
**Int. Cl.³ B64D *17/24***
**U.S. Cl. 244—152** **2 Claims**



1. In a riser assembly for use with a parachute and having:
a main riser which extends, upon deployment of the parachute, upwardly to a junction point;
a pair of risers which, prior to said deployment are in flatly engaged relation, and which, upon said deployment, extend upwardly and in divergent relation from said junction point toward individual attachments for parachute shrouds; and
a lanyard which extends, upon said deployment, upwardly along the main riser past said junction point and along one riser of said pair toward the attachment corresponding to said one riser,
the improvement comprising:
first means disposed in strips for releasably interconnecting the risers of said pair when in said flatly engaged relation, the strips of said first means extending along the lateral edges of the risers of said pair;
a sheath which, upon said deployment, extends downwardly of said junction point along the main riser; and
second means disposed in strips for releasably interconnecting the sheath to the main riser, the strips of said second means extending along the lateral edges of the main riser and, extending, prior to said deployment, between the main riser and the sheath,
so that, prior to said deployment, the lanyard is extendable sequentially:
centrally between the strips of said second means, the sheath, and the main riser;
around said junction point laterally of the risers; and
between the strips of said first means and the risers of said pair
to avoid entanglement of the lanyard during said deployment.

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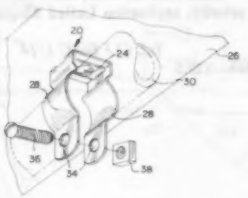
**4,479,625**

## CONDUIT HANGER

**Raymond L. Martz, Palatine, Ill., assignor to Minerallac Electric Company, Chicago, Ill.**

**Continuation of Ser. No. 244,223, Mar. 16, 1981, abandoned. This application Nov. 8, 1983, Ser. No. 550,056**
**Int. Cl.³ F16L *3/08***
**U.S. Cl. 248—74.1** **7 Claims**




1. In a hanger of the type including a generally U-shaped support element having a bearing surface center portion with opening means for attachment to a support structure and the like and a pair of spaced legs having pipe receiving portions extending from opposite ends of said center portion for securing conduit and like members therebetween, the improvement comprising, in combination, said bearing surface center portion having a substantially flat first center surface area extending between said spaced legs and joined thereto, said opening means being centrally positioned with respect to said first center surface area, and a second center surface area integrally abutting said first center surface area, said second center surface area lying in a plane generally parallel to the plane of said first center surface area and spaced a distance therefrom, said second center surface area also extending between said spaced legs and joined thereto, said first and second center surface areas disposed transverse to the plane of said spaced legs whereby the distance differential between said first and second center surface area imparts an increased resistance to bending of said center portion about its lateral and transverse axes when conduit and like members are installed therein, and said depending legs having an aperture below each respective pipe receiving portion for receiving a fastener to secure conduit and the like between said legs, and one of said apertures having a thread impression to threadedly receive said fastener.

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**4,479,626**

## VEHICLE SEAT

**Bernd Klüting, Radevormwald, and Dieter Muhr, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany**

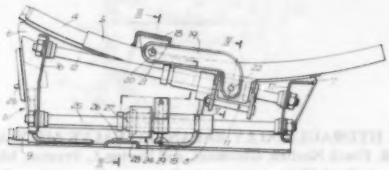
**Filed Jul. 12, 1982, Ser. No. 397,198**
**Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3130444**
**Int. Cl.³ B60N *1/68***
**U.S. Cl. 248—420** **9 Claims**

1. Vehicle seat, the seat portion of which has an adjustable inclination, supported on concave guide rails which are further supported by a seat frame and extend in the longitudinal direction of the seat portion, comprising:

means, arranged in a central section of the seat portion, for locking the seat portion in a selected position;

a bar means of constant length for carrying the locking means, said bar means extending in the longitudinal direction of the seat portion, the ends of said bar means being connected with the seat frame;

an adjusting member which can be moved steplessly in its longitudinal direction and which can be locked in any



position against longitudinal movement, said adjusting member being supported by the bar means; and

a coupling member, being pivotally connected to the adjusting member on one end and being pivotally connected on another end to a support member for the seat portion, said other end of the coupling member being longitudinally movable on the guide rails;

whereby the seat portion is longitudinally adjustable.

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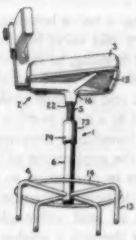
**4,479,627**

## CHAIR HEIGHT ADJUSTMENT MECHANISM

**Robert L. Wehner, Parkville, Mo., assignor to Cramer Inc., Kansas City, Kans.**

**Filed Feb. 10, 1983, Ser. No. 465,563**
**Int. Cl.³ F16M *11/00***
**U.S. Cl. 248—406.2** **6 Claims**



1. A chair height adjustment mechanism for selectively positioning a swivelable seat section relative to a base; said mechanism comprising:

(a) a barrel attached to and extending upwardly from said base and having an upper end;

(b) a threaded spindle having a longitudinal keyway and extending downwardly from said seat section and telescopically received within said barrel;

(c) a bushing aligning said spindle within said barrel and having a lower end inserted in said barrel and an upper end including a flange overlapping said barrel distal end;

(d) a bearing washer slidably mounted on said bushing upper end and having said spindle extending therethrough;

(e) a nut threadably engaging said spindle and having a circular sidewall and an upper and a lower surface; said upper surface having a flange extending radially therefrom and an annular recess extending downwardly from said upper surface and terminating in a groove bottom medially positioned between said upper and lower surfaces; said groove bottom facing upwardly and having teeth thereon; said lower surface having transverse grooves therein;

(f) a coil spring sleeved about said nut and extending beyond said groove bottom; said spring having an upper end abutting said flange of said nut and a lower end abutting said bearing washer, thereby urging said nut and spindle upwardly relative to said barrel; said nut sidewall maintaining alignment of said spring and said spindle;

(g) a J-washer interposed between said nut and said flat washer and contained within said spring lower end, said J-washer having an upper surface with lugs thereon opposing said nut lower surface and including a key extending into said keyway and preventing rotation of said J-washer relative to said spindle;

(h) a housing sleeved about said barrel distal end, bushing, washer, J-washer, nut and spring; said housing having a diameter sized for maintaining said coil spring in alignment with said spindle; said housing including a detent portion extending radially inward past said coil spring and longitudinally downward toward said groove bottom and having teeth thereon;

(i) whereby when said seat section is occupied, said spring is compressed urging said nut to disengage said detent portion, move downwardly and lock against said J-washer and to rotate in unison with said spindle, thereby facilitating simple rotary movement and nonadjustment as said seat section swivels;

(j) whereby when said seat section is unoccupied said spring urges said nut from said J-washer and into engagement with said detent member and hold said nut in non-rotative relationship to said barrel, thereby facilitating rotary movement of said spindle relative to said nut and barrel and causing longitudinal chair height adjustment.

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**4,479,628**

## FISHING ROD HOLDER

**Ronald G. Albright, 2811 Seventh St., SW., Canton, Ohio 44710**

**Filed Mar. 1, 1982, Ser. No. 353,614**
**Int. Cl.³ A45F *3/44***
**U.S. Cl. 248—530** **11 Claims**

1. A fishing rod holder including:

(a) an integral one-piece Y-shaped member having an elongated stake at one end for mounting said member in a generally vertical position and a pair of arms extending upwardly outwardly from an opposite end of said member, said stake and arms merging into and forming a junction zone; and

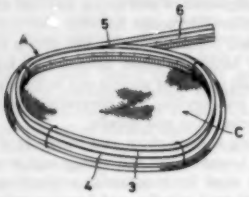
(b) slot means formed in the junction zone of the Y-shaped member for receiving and supporting a portion of a fishing rod therein, said slot means forming retaining means in said junction zone whereby a fishing rod when inserted into the slot means and supported by the junction zone is prevented by the retaining means from being prematurely dislodged from the holder by an unexpected force on the fishing pole, said slot means includes a vertically extending slot and a downwardly inwardly extending passage communicating with the slot beneath an upper end thereof, with the slot and passage forming a projection which provides the rod retaining means.

4,479,629

## MOLDING AID FOR CRANIOPLASTY

Noboru Funatsu, 15-4, Doyamo-cho, Kita-ku, Osaka-shi, Osaka, Japan

Filed Jan. 28, 1983, Ser. No. 462,000
Int. Cl.³ B29C *11/00*
U.S. Cl. 249—53 R 3 Claims




1. A molding aid for molding a filling material used in cranioplasty, comprising a body in the shape of a bar made of an elastomeric material and being of a substantially L-shaped cross section and having a vertical side, a horizontal side, and a core member embeddded in said body along the axis thereof and wherein said core member is made of a flexible material whereby the material selected is such that the said molding aid will be readily bendable and straightenable, and at least one of the end surfaces of the molding aid being at an acute angle with respect to the inner surface of said vertical side and being perpendicular to th einner surface of said horizontal side.

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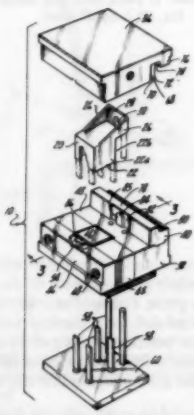
4,479,630

## INTERLOCKING MOLD ASSEMBLY

Heinz Wernecke, Southfield, Mich., assignor to Liberty Die Casting Company, Detroit, Mich.

Filed Feb. 14, 1983, Ser. No. 466,254
Int. Cl.³ B29C *1/00*; B29F *1/022*
U.S. Cl. 249—142 10 Claims



1. Apparatus for molding an object having a body and a flange extending outwardly from said body, said flange including an opening therein through which a bolt or the like may be inserted, comprising:

first and second mold portions conjugally matable to form a mold for said object,

said first mold portion including a mold cavity corresponding in shape to said body, said first mold portion including an extension having a depression therein corresponding in shape to the geometry of said flange, said depression including an elongated core therein extending from a position generally central within said depression to one edge of said extension along a reference axis, said first and second mold portions being separable from each other along said reference axis,

said second mold portion including a molding face covering said depression and flushly abutting said molding core, whereby the opening defined in said flange is slot shaped.

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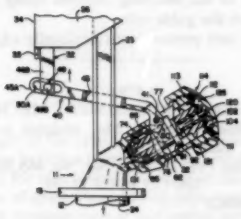
4,479,631

## HYDRAULICALLY BALANCED VALVE MECHANISM

R. Frank Nestich, Glenmont, and Burton L. Preston, Mansfield, both of Ohio, assignors to Interpace Corporation, Purchase, N.Y.

Division of Ser. No. 305,168, Sep. 24, 1981,. This application May 20, 1983, Ser. No. 496,478
Int. Cl.³ F16K *31/126*
U.S. Cl. 251—24 12 Claims



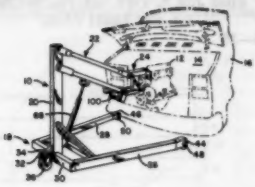
1. A valve comprising: a valve housing, an inlet passage; an exhaust port penetrating said valve housing; a valve seat presented within said valve housing, to surround said inlet passage as it communicates with said valve housing, and located between said exhaust port and said inlet passage; a valve element having a piston secured to a stem portion and received within said valve housing for translation movement; a control chamber by which to effect the application of fluid pressure axially against the stem portion in opposition to the pressure applied on said piston by the fluid being controlled; mechanical means operatively connected to said valve element for initiating translational movement thereof; a washer carried by said piston and adapted sealingly to engage or disengage from the valve seat in response to the translational movement of said valve element to close and open the valve, respectively; a nozzle projecting from said piston and disposed within the perimeter of said valve seat; a bore extending axially of said piston and stem portions; at least one orifice means opening radially through said nozzle and communicating with said axial bore through said piston and stem to effect communication between the said inlet passage and said control chamber, said radial orifice means is open through the nozzle in close proximity to the valve seat when the valve element is seated, upon initial movement of the valve element by the mechanical means the controlled fluid is able to pass between the radial orifice and the valve seat in order to create a venturi effect to reduce the pressure of the fluid in the control chamber to assist the opening of the valve element, and during the closing movement of the valve element a similar venturi effect is created when the radial orifice approaches the valve seat in order to resist closing movement of the valve element, and when the valve is fully seated the pressure in the control chamber will increase to maintain the valve element seated

4,479,632

## DOLLY FOR AN AUTOMOTIVE ENGINE

Ray G. McIntire, and Douglas Colvette, both of c/o Tremac Corporation, 550 Bellbrook Ave., Xenia, Ohio 45385

Filed May 5, 1982, Ser. No. 375,053
Int. Cl.³ B60P 1/04
U.S. Cl. 254—3 B 8 Claims



1. A dolly for adjustably supporting an engine or like workpiece, comprising:

a frame extending substantially horizontally and having a forward end and a rearward end;

caster means mounted to said forward end and said rearward end of said frame;

a post mounted to said rearward end of said frame and extending upwardly therefrom;

a first boom member having a rearward end pivotally mounted to said post, and extending toward said forward frame end and terminating at a forward end;

a second boom member having a rearward end pivotally attached to said first boom member forward end, and extending toward said forward frame end and terminating at an end adapted to receive a workpiece;

means for pivoting said first boom member about said post;

said first boom member includes upper and lower beams, each having a forward end comprising said first boom member forward end, and a rearward end pivotally attached to said post and comprising said first boom member rearward end;

said second boom member rearward end includes an upper stub pivotally attached to said upper beam forward end and a lower clevis pivotally and slidably attached to said lower beam forward end; and

means for sliding said lower clevis relative to said lower beam forward end such that said second boom member pivots about said upper beam forward end so that said second boom member may be oriented relative to the horizontal independently of the orientation of said first boom member to the horizontal.

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4,479,633

## TELESCOPIC DIFFERENTIAL COLUMN HYDRAULIC CYLINDER

Robert B. McCreery, Xenia, Ohio, assignor to The Marmac Company, Xenia, Ohio

Filed Aug. 19, 1982, Ser. No. 409,567
Int. Cl.³ B66F 3/24
U.S. Cl. 254—93 R 8 Claims

1. A hydraulic cylinder capable of withstanding cantiliver loading, said cylinder including a first elongated support member including large and small outside cross-sectional area end portions, a second cylinder member including large and small inside cross-sectional area end portions sealingly and slidingly engaged with said first support member large and small end portions, respectively, defining a peripheral expansion chamber between said support member and said cylinder member, means operative to admit and evacuate fluid under pressure to and from said expansion chamber, said large and small end portions of said second cylinder member defining large and small outside cross-sectional area end portions, and a third cylinder member including a large cross-sectional area base end and a small cross-sectional area far end sealingly and slidingly engaged, respectively, with said large and small end portions of said second cylinder member and defining a peripheral expansion zone between said second cylinder member and said third cylinder member between said base and far ends, means establishing communication between said chamber zone, the end of said small diameter end portion of said support member remote from the large diameter end portion thereof including an abutment thereon against which the small diameter end portion of said second cylinder member may abut to

limit movement of said second cylinder member away from said large end portion of said support member, said small diameter end portion of said second cylinder member including an abutment thereon against which said far end of said third cylinder member may abut, and abutment means operative to limit movement of said second and third cylinders relative to and toward the large end portions of said support and second cylinders members, respectively.

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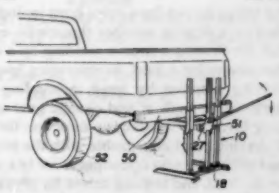
4,479,634

## JACKABLE PROP

Rienhold J. Blatz, Alberta, Canada, assignor to Lyrone Kelsey Industries Ltd., Alberta, Canada

Filed Aug. 26, 1983, Ser. No. 526,814
Claims priority, application Canada, Jun. 23, 1983, 431116
Int. Cl.³ B66F 3/00
U.S. Cl. 254—133 R 15 Claims



1. A jackable prop comprising:

(a) a base, including a transverse plate, and a pair of widely spaced-apart, forwardly-projecting, feet;

(b) a pair of spaced-apart, posts each having a polygonal cross-section upstanding from said base;

(c) a freely-vertically-movable lifting frame, slidably but not relatively rotatably mounted on said posts, said lifting frame comprising:

(i) a pair of bushings, each having a similar polygonal cross-section, each bushing having a length-to-width ratio of at least about 4-to-1 and being freely but not relatively rotatably slidably mounted on a respective said post, each said bushing thus being precluded from

slewing with respect to its associated said post and also being inhibited from twisting and jamming when sliding with respect to its associated said post;

(ii) a transverse bar interconnecting said bushings;

(iii) a pair of forwardly projecting load bearing lifting arms; and

(iv) engagement means secured to said transverse bar, said engagement means being adapted to be engaged by disengageable operable elevating means, whereby operation of said disengageable elevating means causes said transverse bar, and hence said load-bearing lifting arms, to be raised against a load applied directly thereon; and

(d) manually operated means independent of said elevating means and cooperating between each said bushing and each said associated upstanding post for holding said lifting frame at a predetermined raised vertical position on each associated said post after said lifting frame has been so raised and upon disengagement and removal of said elevating means out of engagement with said engagement means.

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**4,479,635**

## IDLING DEVICE FOR LEVER HOIST

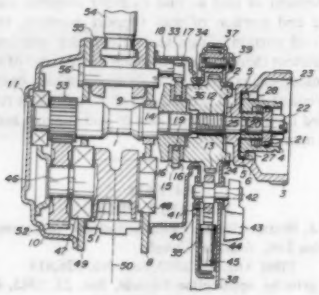
**Kazuo Maeda, Yokohama, Japan, assignor to Kabushiki Kaisha Kito, Kawasaki, Japan**

**Filed Mar. 8, 1983, Ser. No. 473,305**

**Claims priority, application Japan, Jun. 7, 1982, 57-96294**

**Int. Cl.³ B66D** *1/14, 5/32*

**U.S. Cl. 254—350** **9 Claims**



1. An idling device for a lever hoist including a change gear provided on a driving member threadedly engaged on a driving shaft for driving a sheave winding up a chain, rope or the like thereabout for a load, an operating lever rockable about said driving member by hand, a winding-up driving pawl engageable with teeth of said change gear and driven by said operating lever in a winding-up direction for the load, a winding-off driving pawl engageable with the teeth of said change gear and driven by said operating lever in a winding-off direction for the load, and braking means for preventing said change gear from being driven from said sheave, said braking means being clamped and released by rotative movement of said driving member relative to said driving shaft, said device comprising a change-over knob fitted on said driving shaft axially slidably but against rotation relative thereto at one end of said shaft on an opposite side of said braking assembly with respect to said change gear, and a manually operatable knob fitted on and rotatable and a ially slidable relative to said driving shaft between said change-over knob and said driving member and provided with rotative movement transmitting means for transmitting rotative movement between said manually operatable knob and said driving member and said knobs comprising holding means for holding said manually operatable knob relative to said change-over knob to prevent said manually-operatable knob from rotating relative to said driving shaft and hence prevent said driving member from clamping said braking assembly.

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**4,479,636**

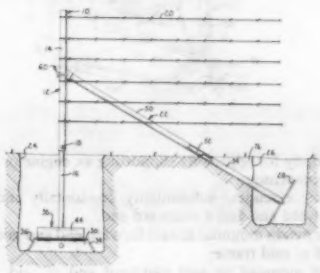
## FENCE POST CONSTRUCTION

**Clyde R. King, Rte. 1, Box 170, Crane, Mo. 65633**

**Filed Jun. 6, 1983, Ser. No. 501,524**

**Int. Cl.³ E04H** *17/02*

**U.S. Cl. 256—35** **4 Claims**



1. An assembly for anchoring a fence comprising:

a main post for installation in an upright position extending into a post hole which extends vertically into the ground below the frost line;

a dead man secured to the post below ground level, said dead man including a pair of elongated, horizontally spaced apart, rigid members, each member extending laterally from the post in both directions toward the perimeter of the post hole, a first pressure plate being secured to the ends of said members on one side of the post, a second pressure plate being secured to the opposite ends of said members on the other side of said post, an elongated, rigid element projecting laterally from the post in directions normal to the directions of projection of said members, third and fourth pressure plates secured to corresponding ends of respective elements, each plate being inclined upwardly and inwardly toward the post, and means engaging the element with said members whereby forces from the post are transmitted to the adjacent soil through said four plates so that the resistance to said forces by the undisturbed soil serves to stabilize the post against lateral movement under the influence of said forces.

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**4,479,637**

## APPARATUS FOR AND METHOD OF REPAIRING BOTTOM LINING OF A CONVERTER

**William H. Sangster, Collinsville, and Gilbert G. Moss, Fairview Hgts., both of Ill., assignors to National Steel Corporation, Pittsburgh, Pa.**

**Filed Sep. 1, 1982, Ser. No. 413,754**

**Int. Cl.³ C21C** *5/46*

**U.S. Cl. 266—281** **9 Claims**

1. An expandable and retractable overhead safety shield for protecting workers on a vertically movable work platform during repair of the refractory lining of a metallurgical furnace such as a Q-BOF having an open top and a closable opening in its bottom wall, the safety shield comprising,

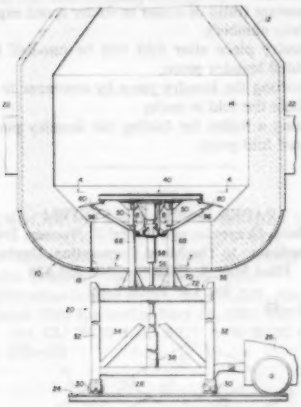
a rigid central portion extending above at least a portion of the work platform,

a plurality of shield extension plate members pivotally mounted in overlapping relation around said rigid central portion for movement between a generally vertical retracted position and an extended position projecting outwardly from said rigid central portion,

first power means for moving the shield extension plate members between the retracted and expanded positions,

said safety shield being of a size and configuration to be moved vertically through the closable opening in the furnace bottom wall when the shield extension members are in the retracted position,

said shield extension plate members in the extended position cooperating with said central portion to form a substantially continuous umbrella-like cover extending above said



platform and having an area substantially greater than that of the opening in the bottom wall of the furnace,

mounting means on the platform supporting said safety shield in vertically spaced relation to the platform, and

said first power means being operably connected to selected ones only of the overlapping plate members, whereby movement of said selected ones of said plate members by said first power means results in simultaneous movement of all plate members.

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**4,479,638**

## SPRING DEVICE

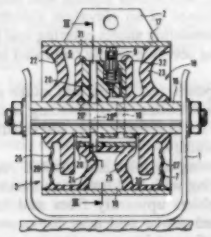
**Franz J. Wolf, Bad Soden-Salmünster, and Hubert Pletsch, Birkenau, both of Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmünster, Fed. Rep. of Germany**

**Filed Jun. 16, 1982, Ser. No. 389,147**

**Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130830**

**Int. Cl.³ F16F 9/19**

**U.S. Cl. 267—64.17** **12 Claims**



1. A self-activated load-independent level adjusting spring device for interconnecting two parts of a machine which are movable with respect to each other, comprising an outer metal sleeve rigidly connected to one of said parts, an inner metal sleeve rigidly connected to the other of said parts, said inner sleeve being generally disposed within said outer sleeve to provide a space between said inner sleeve and said outer sleeve, an elastomer member disposed in said space between said inner and outer sleeves, a pump means having a pump chamber provided in a pump housing and a piston therein, said pump housing being connected to one of said sleeves, said piston being operable in said pump chamber and being engageable with the other of said sleeves such that the relative position of said piston in said pump chamber corresponds to the relative radial position between said inner and outer sleeves and thus to the relative position between said two parts, spring chamber means at least partially defined by said elastomer member for containing a hydraulic fluid, said spring chamber means being disposed between said inner and outer sleeves, supply chamber means at least partially defined by said elastomer member for containing a hydraulic fluid supply, said supply chamber means being disposed between said inner and outer sleeves, a first passageway connected between said pump chamber and said supply chamber means, a first control valve in said first passageway opening upon the suction stroke of said pump, a second passageway connected between said pump chamber and said spring chamber means, and a second control valve in said second passageway opening upon the pressure stroke of said pump, a third passgeway between said pump chamber and said supply chamber means, said third passageway leading to a first opening in said pump chamber, said first opening being at a position to be covered and uncovered by said piston depending on the position of said piston in said pump chamber whereby the passage of fluid through said third passageway is controlled by the position of said piston in said pump chamber, a fourth passageway between said pump chamber and said spring chamber means, said fourth passageway leading to a second opening in said pump chamber, said second opening being at a position to be covered and uncovered by said piston depending on the position of said piston in said pump chamber, whereby said pump means is actuated upon relative movement between said two parts to effect a pumping action of pressure and suction pulses between said supply chamber means and said spring chamber means via said first and second passageways to thereby provide load-independent, level regulation between said two parts, and whereby in the uncovered position of said first and second openings, the fluid pressure within said spring chamber means is decreased through a by-pass connection to said supply chamber means via said third and fourth passageways.

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**4,479,639**

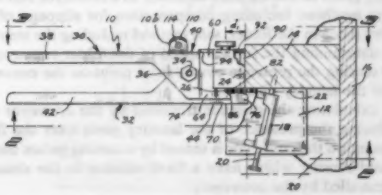
## TOOL FOR POSITIONING ELECTRIC OUTLET BOXES

**Michael W. Kane, 2712 - 65th Ave. North, Minneapolis, Minn. 55430**

**Filed Sep. 30, 1982, Ser. No. 429,510**

**Int. Cl.³ B25B 21/20**

**U.S. Cl. 269—6** **5 Claims**



1. A tool for positioning an electrical box for attachment to a building framing member comprising:

a first jaw element including a plate for contacting a first of the outside and inside surfaces of a wall of an electrical box;

a second jaw element having two spaced-apart fingers for

contacting the second of the outside and inside surfaces of the wall of the electrical box;

means to bias the first and second jaw elements together to grip the wall of the box between the plate and the two fingers;

a stop means mounted on one jaw element for contacting a facing edge of the wall of the electrical box;

a spacer plate on one jaw element for contacting a face of a building framing member to determine the relative position of the face of the framing member and the facing edge of the wall of the box when the wall of the box is positioned adjacent a side of the framing member;

adjustment means for adjusting the position of the spacer plate relative to the stop means, thereby varying the relative position of the facing edge of the wall of the box and the face of the framing member;

wherein the jaw element carrying the spacer plate has a first surface;

wherein the spacer plate has a leg with a second surface extending generally parallel to and in sliding contact with the first surface of the jaw element;

wherein the adjustment means includes protruberances on one surface and corresponding recesses on the other surface, the protruberances engaging the recesses in a finite number of fixed positions; and

the adjustment means further including a threaded bolt mounted through the leg and threadably engaged with the jaw element to tighten the two surfaces in close contact with each other.

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**4,479,640**

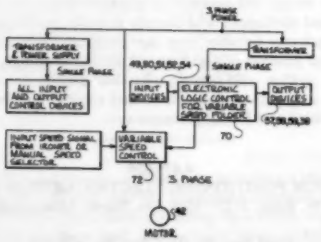
**FLAT PIECE FOLDING APPARATUS WITH VARIABLE SPEED, AND METHOD**

**Carol E. Smith, 2314 Merimac Dr., Charlotte, N.C. 28210**

**Filed Jul. 22, 1983, Ser. No. 517,080**

**Int. Cl.³ B41L *43/00*; A41H *33/00***

**U.S. Cl. 270—32** **9 Claims**




1. A method for determining the proper fold points on a laundry piece delivered from an ironer to a conveyor belt-type folding machine, including compensation for slippage of the laundry piece in the folder, said method including the steps of:

(a) determining the surface speed of the folder conveyors;

(b) sensing the presence over a fixed point on the conveyer of the laundry piece;

(c) calculating the distance travelled by the conveyor belt during the presence of the laundry piece over the fixed point on the conveyor is sensed by counting pulses during said sensing which have a fixed relation to the distance travelled by the conveyer;

(d) determining the ratio of the feed rate of the ironer to the surface speed of the folder conveyer;

(e) determining the distance from the fixed point where the presence of the laundry piece is sensed to the point where the fold will be made;

(f) determining the type of fold to be made;

(g) determining where to crease the laundry piece to make the fold according to the formula:

$$F1 = L1 - \frac{[PC - (PC \div K)]}{2}$$

Where

F1 = First fold point on laundry piece;

L1 = Distance from sensor at fixed point on the conveyor to the point where the fold will be made;

PC = Number of pulses counted;

K = Constant (ratio of ironer to folder speed expressed as a whole number);

2 = Laundry piece after fold will be one-half length of unfolded laundry piece;

(h) transporting the laundry piece by conveyor to the position where the fold is made;

(i) activating a folder for folding the laundry piece at the calculated fold point.

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**4,479,641**

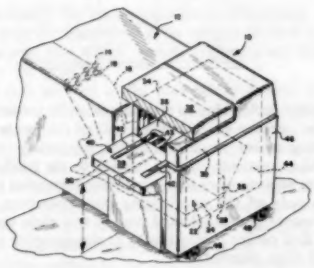
**PAPER HANDLING SYSTEM**

**Harley F. Bean, Grapevile, and Daniel T. Noonan, Irving, both of Tex., assignors to The Mead Corporation, Dayton, Ohio**

**Filed Mar. 8, 1982, Ser. No. 355,426**

**Int. Cl.³ B42B *2/00***

**U.S. Cl. 270—53** **8 Claims**



1. For use with a duplicating device of the type having printing means for imparting an image onto single sheets of paper, and conveying means including a sheet feed station for conveying sheets from the printing means to the sheet feed station, a paper handling system comprising:

a gravity feed accumulator for receiving sheets serially from a sheet feed station and collecting them into a set, said accumulator having an intake for communicating with a sheet feed station to receive sheets therefrom, an outlet, positioned at a lower elevation than and sidewardly from said intake, through which sets of collected sheets leave said accumulator, and means joining said intake and said outlet and positioned at an elevation therebetween, for repetitively accumulating sheets entering said intake into a set and conveying sets sidewardly from said intake to said outlet;

a finishing station positioned below said intake and communicating with said outlet, said finishing station having transition means for conveying sets sidewardly from said outlet then rearwardly;

elevator means having an inlet end located rearwardly of and communicating with said transition means, means for conveying pamphlets upwardly from said inlet, and an outlet end located above said inlet for conveying pamphlets forwardly from said conveying means;

top-loading stacker means superposed to said finishing station and having an upper level communicating with said outlet end, a substantially horizontal tray and means for indexing said tray in a vertical direction downwardly from said upper level such that a first bound pamphlet may be conveyed forwardly from said outlet means,

placed upon said tray at said upper level, and said table indexed downwardly repeatedly so that successive pamphlets may be stacked one on top of another; and

discharge conveyor means communicating with said stacker means and said tray and having a discharge station positioned exteriorly and forwardly of said stacker means for transporting a stack of bound pamphlets from said tray to said discharge station, said discharge station being located at an elevation intermediate the elevations of said upper level and said finishing station.

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**4,479,642**

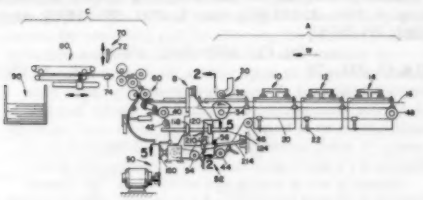
## RECIPROCATING STITCHER ASSEMBLY OPERABLE ALONG SIGNATURE PATH

**Keith S. Macey, Rocky River, Ohio, assignor to K. S. Macey Machine Company, Inc., Cleveland, Ohio**

**Continuation-in-part of Ser. No. 364,225, Apr. 1, 1982, abandoned. This application May 24, 1982, Ser. No. 381,529**

**Int. Cl.³ B42B *1/02*; B27F *7/08*; B42C *1/12***

**U.S. Cl. 270—53** **21 Claims**



1. A stitcher assembly for stitching workpieces which are being conveyed longitudinally along a workpath, said assembly comprising:

a frame assembly having a longitudinal axis extending therethrough and including a stitcher head mounting means and a clincher mounting means which are adapted to mount at least one stitcher head and clincher in a cooperative relationship to the frame assembly;

surface defining means for defining a workpiece supporting surface extending longitudinally through the frame assembly generally intermediate the stitcher head mounting means and the clincher mounting means;

reciprocating means for cyclically reciprocating the frame assembly generally along the workpath in coordination with movement of the conveyed workpiece along the workpath;

a stitcher head actuating means which is adapted to actuate at least one stitcher head mounted on the stitcher head mounting means, the stitcher head actuating means being operatively connected with the frame assembly and operatively connected with the reciprocating means to cause stitcher head actuation at a selected point in each reciprocation cycle; and,

a clincher actuating means which is adapted to actuate at least one clincher mounted on the clincher mounting means, the clincher actuating means being operatively connected with the frame assembly and operatively connected with the reciprocating means to actuate the clinchers at substantially said selected point in each reciprocation cycle.

**4,479,643**

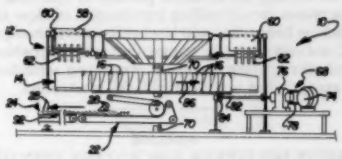
## METHOD AND APPARATUS FOR TRANSFERRING NEWSPAPERS FROM POCKETS TO AN OVERLAPPED STREAM

**Randy R. Seidel, Champlain, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.**

**Filed Sep. 27, 1982, Ser. No. 424,025**

**Int. Cl.³ B65H *5/30***

**U.S. Cl. 270—55** **17 Claims**



1. An apparatus for transferring newspapers into an overlapped stream from pockets moving in a first direction at a first speed, said apparatus comprising means for sequentially engaging the closed edge portion of each of the newspapers in turn as it moves out of a pocket, for accelerating the closed edge portion of an engaged newspaper in the first direction to a second speed which is greater than the first speed while an open edge portion of the newspaper is disposed in a pocket which is moving at the first speed and for moving a first major side of each one of the newspapers in turn and a second major side of an immediately preceding newspaper into abutting engagement with the open edge portion of the one newspaper disposed in a pocket, and means for forming the newspapers into an overlapped stream with the closed edge portion of each of the newspapers leading and with the first major side of each of the newspapers facing downwardly.

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**4,479,644**

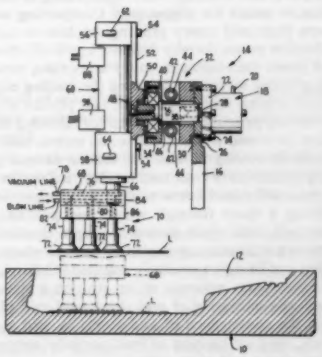
## IN-MOLD LABELER

**George F. Bartimes, Chicago; John L. Avery, Matteson; Leonard A. Blomquist, Joliet, all of Ill., and Stephen B. McDonald, Lima, Ohio, assignors to Continental Plastic Containers, Inc., Stamford, Conn.**

**Filed Jul. 19, 1983, Ser. No. 515,248**

**Int. Cl.³ B29C *1/00*; B65H *3/08***

**U.S. Cl. 271—107** **9 Claims**



9. A label applicator for transferring a label from a generally horizontal label stack into a generally vertically opening mold, said label applicator comprising a horizontal shaft, support means mounting said shaft for rotation about its axis, a support bracket carried by said shaft for rotation therewith, an extensi-

ble fluid cylinder, said support bracket carrying said fluid cylinder with said fluid cylinder having an axis generally normal to the axis of said shaft, said fluid cylinder having a piston rod, a label pick-up head carried by said piston rod for selected projection and retraction, and a motor for oscillating said shaft to first present said label pick-up head to a label stack to pick up a label and then by rotating said shaft to then present said label pick-up head to a mold half to position a label in said mold half, sensor means for separately sensing both the retracted position and the extended position of said fluid cylinder, said means for sensing the extended position of said fluid cylinder forming means for controlling introduction of blow air to said label pick-up head when said label pick-up head is aligned with a mold, and said means for sensing the retracted position of said fluid cylinder forming means for preventing actuation of said motor except when said fluid cylinder is retracted.

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**4,479,645**

## SHEET DELIVERER FOR ROTARY PRINTING MACHINES

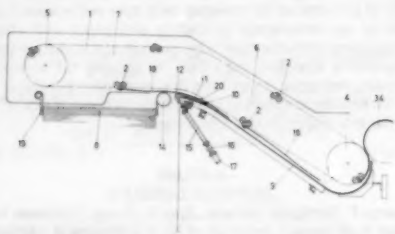
**Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany**

**Filed Mar. 29, 1982, Ser. No. 363,117**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113750**

**Int. Cl.³ B65H** *29/04, 29/24, 29/68*

**U.S. Cl. 271—183** **16 Claims**



1. A sheet deliverer adapted for sequentially transporting sheets having printed portions at least on the undersides thereof and print-free margins defining said printed portions from a rotary printing machine to means defining a product collection site, said sheet deliverer comprising in combination:

continuous means for sequentially transporting said printed sheets from said rotary printing machine to said product collection means thereby defining a path of conveyance of said sheets therebetween, said transporting means including gripping means for gripping the leading edge portion of said printed sheets as each of said printed sheets leaves said rotary printing machine and for releasing said printed sheets over said product collection means, said transporting means having at least one section extending substantially horizontally over said product collection means;

plate means disposed below said transporting means thereby defining a space through which said printed sheets are conveyed, said plate means having a downstream end portion terminating upstream of said product collection means and being transversely oriented relative to said path of conveyance, wherein an air cushion is developed between the underside of said sheets and said plate means upon the conveyance of said sheets by said transporting means, said air cushion at least partially supporting said sheets above said plate means;

a plurality of elongated guide yoke means defining a conduit through which blown air can pass, said guide yoke means being disposed along said downstream end portion substantially equally spaced relative to each other therealong, each of said guide yoke means being oriented in a direction opposite to said path of conveyance so that said blown air is directed opposite to the direction of said path of conveyance;

adjustment means for transversely adjusting said guide yoke means so that said guide yoke means only contacts said printed sheets along the print-free margins thereof; and

a plurality of braking means downstream of said guide yoke means, each of said guide yoke means being paired with a predetermined one of said braking means, said braking means for contacting said printed sheets at the print-free margins thereof and for reducing the velocity of conveyance of said printed sheets so that upon release of said leading edge portion by said gripping means, said printed sheets will be deposited into said product collection means;

said guide yoke means, by virtue of said blown air, for (a) creating a partial vacuum along said downstream end portion of said plate means to cause said sheets to be drawn against said guide yoke means to thereby cause a trailing edge of said sheet to contact said braking means and (b) supplementing said developed air cushion to support said sheets above said plate means to prevent contact between said conveyed sheets and said plate means.

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**4,479,646**

## GYMNASTIC BICYCLE

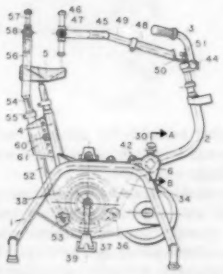
**Jose L. Beistegui Chirapozu, Vitoria, Spain, assignor to B.N., S.A., Madrid, Spain**

**Filed Aug. 3, 1982, Ser. No. 404,892**

**Claims priority, application Spain, Aug. 5, 1981, 259.882[U]; Aug. 5, 1981, 259.883[U]; Aug. 5, 1981, 259.884[U]; Aug. 5, 1981, 259.885[U]**

**Int. Cl.³ A63B** *23/02, 69/06*

**U.S. Cl. 272—73** **12 Claims**



1. A gymnastic bicycle comprising:

a frame mountable on a floor and having front and rear portions;

a first stem supporting at a first end thereof a handlebar and having a second end pivotally mounted on said front portion of said frame for oscillating movement with respect thereto in forward and rearward directions;

a second stem supporting at a first end thereof a seat and having a second end fixed to said rear portion of said frame;

a pedal shaft having pedals and rotatably mounted transversely of said frame;

friction means, mounting said second end of said first stem on said front portion of said frame, for adjusting the resistance to the physical force of a user required to oscillate said first stem and said handlebar in said forward and rearward directions;

main vibrating means, including a polygonal member fixedly mounted on said pedal shaft, for, upon rotation of said shaft, imparting vibrations to said first stem and to said handlebar;

abdominal vibrating means, mounted on said handlebar, for

transmitting said vibrations from said handlebar to the abdominal region of the user; and

lumbar vibrating means, mounted on said second stem and operable by said main vibrating means independently of said abdominal vibrating means, for imparting vibrations to the lumbar region of the user.

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**4,479,647**

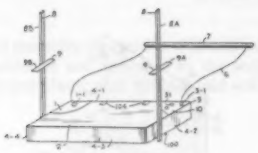
**RESISTANCE EXERCISER**

**Robert S. Smith, 1263 Emory St., San Jose, Calif. 94126**

**Filed Dec. 30, 1981, Ser. No. 335,911**

**Int. Cl.³ A63B *21/02, 21/24***

**U.S. Cl. 272—117** **10 Claims**



1. A structure for assisting a person to perform exercises comprising:

a movable member;

means, coupled to said movable member, for retracting and for allowing the extension of said movable member; and

means, including a release mechanism, for controlling said means for retracting and for allowing the extension of said movable member such that said movable member is

(i) extended when both a force equal to or greater than a very slight predetermined force $F_1$ is applied thereto and said release mechanism is simultaneously activated,

(ii) held fixed when both a force equal to or greater than $F_1$ and less than or equal to a second force $F_2$ preselected independently of $F_1$ and larger than $F_1$ is applied thereto and said release mechanism is not activated,

(iii) extended when both a force greater than $F_2$ is applied thereto and said release mechanism is not activated, and

(iv) retracted when a force less than $F_1$ is applied thereto

wherein said means for controlling further comprises:

a mode selection means having a first isotonic mode and a second isometric mode, and

signal means such that when said mode selection means is in said first isotonic mode said means for controlling operates as in (i)–(iv) and when said mode selection means is in said second isometric mode

(a) said movable means is held fixed when a force is applied thereto, and

(b) said signal means emits a signal so long as the force applied to said movable member exceeds said preselected force $F_2$ and the total time said applied force exceeds $F_2$ is less than a preselected time period.

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**4,479,648**

**BOWLERS WRIST BRACE**

**Martin J. Alivo, Jr., 8118 Brentwood Ave., Milwaukee, Wis. 53223**

**Filed Jun. 7, 1982, Ser. No. 385,578**

**Int. Cl.³ A63B *71/14***

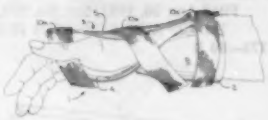
**U.S. Cl. 273—54 B** **4 Claims**

1. A wrist brace for use by bowlers to prevent rotational movement of the hand about the wrist joint comprising

an elongated channel shaped rigid member custom shaped to precisely fit the contours of the wearer's hand, wrist and lower forearm, said elongated member consisting of

a hand portion having a rigid palm piece engaging substantially all of the wearer's palm so that only the palm portion at the base of the wearer's thumb is exposed, said palm piece being curved slightly inwardly toward the palm in order to follow the natural contour of the hand and eliminate any play or room for movement between the hand and said hand portion, and a rigid backhand piece joined by a rigid side piece, said side piece disposed along the side of the hand opposite the thumb so as to allow the area between the thumb and the index finger to remain substantially unobstructed,

a rigid wrist portion connecting said hand portion to a rigid lower forearm portion, said rigid wrist and forearm portions engaging substantially all of the wearer's wrist and



lower forearm, said hand portion connected to said wrist portion at a predetermined angle enabling said brace to maintain the hand at the desired said angle to the wrist during delivery of the ball and specifically at the point of release, said palm piece cooperating with said forearm portion to prevent rotational movement of the hand about the wrist joint, and

a plurality of fastening members spanning the opening of said channel shaped member and securing said member to the wearer's hand.

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**4,479,649**

**ILLUMINATED PLAYBALL**

**Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of Mirror Lake, N.H. 03853**

**Filed Jun. 1, 1983, Ser. No. 499,985**

**Int. Cl.³ A63B *41/00***

**U.S. Cl. 273—61 R** **3 Claims**

1. An article of manufacture comprising a molded, hollow, spherical ball made of airtight, flexible, elastic, translucent plastic material,

a self-sealing valve mounted on the interior wall of said ball and enclosed within a covering of said material that is molded thereabout simultaneously with the molding of said ball,

a light stick supporting post extending radially inward from said interior wall at a position substantially diametrically opposite said valve, said post being of the same said material as said ball and molded integrally therewith,

said post and wall from which said post extends having a continous open radially directed bore therethrough of a size adapted to accept under endwise manual pressure a light stick of larger diameter than said bore,

and a light stick adapted to be positioned in said post, the length of said light stick being such that when said light stick is positioned in said post its outer end is fluah with the outer surface of said ball and its inner end extends beyond the end of said post,

the character of said post being such that when said light stick is positioned therein and in activated condition, the light given off by said light stick will in part effectively pass through the surrounding wall of said post and in part will emanate directly from the free inner end of said light stick, the total light from said light stick being adequate to illuminate substantially the entire ball to a degree enabling said ball to be used in the dark.

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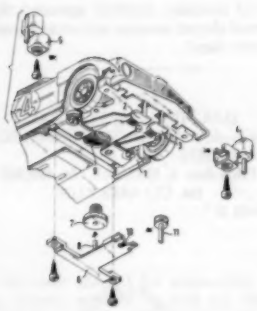
**4,479,650**

## TOY-RACING EXPRESS MOTOR ROAD

**Hermann Neuhierl, Waldstrasse 36, D-8510 Fürth/Bayern, Fed. Rep. of Germany**

**Filed Apr. 26, 1982, Ser. No. 371,554**
**Int. Cl.³ A63F *9/14*; A63H *18/08***
**U.S. Cl. 273—86 B** **12 Claims**



1. A toy-racing express motor road system comprising:

a plurality of race track sections arranged serially and defining at least two side-by-side travel tracks defining a roadway, each said track having current conductors;

a pair of cars each having a drive means and current collecting means for establishing an electrical supply from said current conductors to said drive means;

means associated with each said travel track of each track section defining a guiding groove along the entire length of the section;

means at the opposite side edges of each track section defining a guiding edge along its entire length;

finger-removable guide means on each said car for selective cooperation with one of said guiding grooves for trackbound operation of the car along a selected one of said tracks;

side guide means on each said car for cooperating alternatively with either said guiding edge for freely steerable operation of the car; and

steering means controllable through said current conductors and said current collecting means for controllably operating each of said cars selectively along said roadway in the trackbound mode with its guide means engaged in one of said grooves or the freely steerable mode with its guide means removed whereby said pair of cars may be raced along said roadway selectively with (a) each car being operated in the trackbound mode, (b) each car being operated in the freely steerable mode, or (c) either car being operated in the trackbound mode and the other car being operated in the freely steerable mode, as desired.

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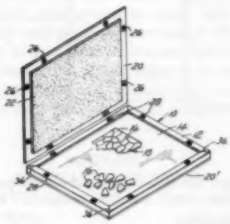
**4,479,651**

## JIG-SAW PUZZLE WORK BOARD

**Robert H. LaFleur, 1729 Cresthill, Royal Oak, Mich. 48073**

**Division of Ser. No. 236,803, Feb. 23, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 419,966**
**Int. Cl.³ A63F *9/10*; B65D *85/00***
**U.S. Cl. 273—157 R** **2 Claims**



1. A portable jig-saw puzzle work board comprising a rectangular four-sided frame, said frame having a top surface, a bottom surface, and a four-sided inner wall extending from said bottom surface to said top surface, a rectangular panel mounted between said sides of said inner wall proximate the middle of said inner wall, two work surfaces defined by the respective sides of said panel, one of said work surfaces being recessed relative to said top surface of said frame and the other of said work surfaces being recessed relative to said bottom surface of said frame, a first lid which overlaps said top surface of said frame when said first lid is in a closed position and a second lid which overlaps said bottom surface of said frame when said second lid is in a closed position, a padding attached to a side of each of said lids, each of said paddings being attached to a lid along one surface of the padding, each of said paddings being made of resilient elastomeric material and having length and width dimensions enabling the padding to fit within said inner wall of said frame with the other surface of the padding freely extending to a recessed work surface such that said freely extending other surface of the padding resiliently engages puzzle pieces placed on a recessed work surface and holds said puzzle pieces in a fixed position by applying pressure thereto, a plurality of patches of Velcro material also attached to said side of each of said lids, said patches of Velcro material being disposed proximate the edges of said lids beyond the area of said lids covered by said paddings, and corresponding patches of complementary Velcro material attached to said surfaces of said frame at appropriate positions such that each corresponding patch of complementary Velcro material is aligned with a patch of Velcro material when said lids are in said closed positions.

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**4,479,652**

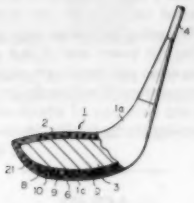
## WOOD-TYPE GOLF CLUB HEAD

**Itsushi Nagamoto, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan**

**Filed Jun. 1, 1983, Ser. No. 499,997**
**Claims priority, application Japan, Jun. 26, 1982, 57-110473**
**Int. Cl.³ A63B *53/04***
**U.S. Cl. 273—172** **4 Claims**

1. A wood-type golf club head comprising a fiber reinforced plastic shell,

a sole plate attached to the sole side of said fiber reinforced plastic shell, and



a weight strap generally coextensive with said sole plate and fully embedded in and embraced by the section of said fiber reinforced plastic shell defining said sole side.

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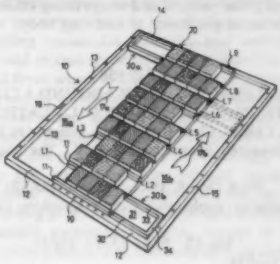
**4,479,653**
**GOLF SWING TRAINER**
**Leland B. Woodson, 314 E. 12th, Hutchinson, Kans. 67501**
**Filed Jun. 7, 1983, Ser. No. 501,823**
**Int. Cl.³ A63B *69/36***
**U.S. Cl. 273—183 B** **10 Claims**

1. Golfer swing training apparatus comprising an elongated handle guide means having a free end and constrained end, said guide means being flexible and resilient, a base and coacting means carried by the base and the constrained end of the guide means for constraining the constrained end of the guide means to a position substantially fixed relative to the base while enabling an assentially swinging movement of the guide means about the coacting means as an apex, a simulated and elongated golf club handle of substantially lesser length than the guide means, said handle being operatively mounted on the guide means for guidance along the extent of the latter, with the handle and guide means coacting in such a manner that the extent of the handle remains essentially parallel to the extent of the guide means immediately adjacent thereto, said base being adapted to bear against the person of a user, and said base being provided with means enabling its detachable securance to the person of the user, the arrangement being such that a user may grip the simulated handle when the latter is adjacent the constrained end of the guide means while assuming a stance customary on addressing a golf ball, whereupon all subsequent manipulations of the handle by the user during a simulated backswing and ensuing follow through subject the user's handle gripping hands to forces resulting from coaction of the resiliently flexing guide means and the handle that enable the user quickly to sense departures from a desired mode of swing, while virtually compelling the handle to travel a swing path inconsistent with the user rearing up as the handle approaches and departs from the immediate vicinity of the constrained end of the guide means.

**4,479,654**
**GAME WITH CONVEYOR**
**Ivan Moscovich, 19 Elkachi St., Afeka, Ramat Aviv, Israel**
**Filed Jun. 3, 1982, Ser. No. 384,771**
**Int. Cl.³ A63F *3/00***
**U.S. Cl. 273—271** **9 Claims**



1. A game, comprising:
a base member divided into a plurality of aligned zones each open at their opposite ends;
a plurality of playing pieces of like dimensions adapted to be received in said zones, at least some of said playing pieces being individually distinguishable from others;
and a conveyor at each of said opposite ends of the zones, each conveyor having a length to receive at least two playing pieces but less than the number adapted to be received in each of said zones, said conveyor being slidable along the open ends of the aligned zones for shifting playing pieces from one zone to another;
the total number of playing pieces included in the game being less than the total number adapted to be accommodated in all said zones, such that there are always some empty spaces in the zones for receiving playing pieces as they are shifted among the zones by the use of said slidable conveyor.

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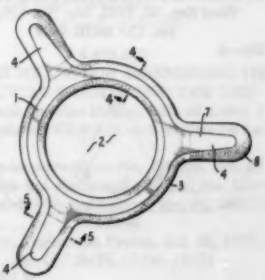
**4,479,655**
**BOOMERANG**
**Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94306**
**Filed Dec. 21, 1983, Ser. No. 564,471**
**Int. Cl.³ A63B *65/08***
**U.S. Cl. 273—425** **7 Claims**



5. A boomerang of substantially planar configuration comprising;
a. ring body means comprising a substantially planar ring having a central opening with a diameter of 5.4 inches, an outer perimeter with a diameter of 8.1 inches, and an axial thickness of 0.13 inches, said ring having a streamlined cross-section described by a convex upper line and a substantially straight bottom line,

b. three wings, each extending 3.5 inches radially outward from the outer perimeter of said ring body, each wing having; a chord of 1.9 inches, a thickness of 0.13 inches, a streamlined cross-section described by a convex upper line and a substantially straight lower line, and an angle of twist of substantially 3 degrees relative to the plane of said ring body, the roots of said wings being smoothly blended into the outer perimeter of said ring body.

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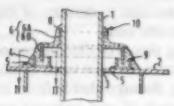
4,479,656

## MEANS FOR SEALING A GAP AROUND A CONDUCTOR PIPE IN AN OFFSHORE OIL PLATFORM

Michael H. Collins, Chester, England, assignor to Shell Internationale Research Maatschappij B. V., The Hague, Netherlands

Filed Oct. 8, 1982, Ser. No. 433,521
Claims priority, application United Kingdom, Oct. 20, 1981, 8131591
Int. Cl.³ F16J 15/44, 15/40
U.S. Cl. 277—135 19 Claims



1. Offshore platform being provided with a conductor pipe passing through deck portion of the platform, thereby forming a gap in the deck portion around the pipe, wherein means are provided for sealing the gap, said means including a first and a second annular element member arranged around the conductor pipe and connected to the conductor pipe and the deck portion, respectively, one of the annular elements forming at least part of the wall of an annular trough with an open upper end, and the other annular element being arranged to protrude partly into the trough, the trough being filled with a flexible substance.

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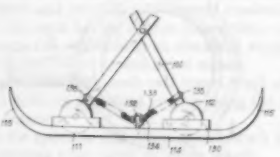
4,479,657

## STROLLER SKIS

Florence U. Reynolds, 1529 Derbyshire Rd., Yardley, Pa. 19067

Filed Sep. 30, 1982, Ser. No. 429,073
Int. Cl.³ B62B 9/04
U.S. Cl. 280—8 1 Claim



1. A ski assembly for use with a stroller having a pair of downwardly diverging leg members on each side of the stroller and at least one wheel attached to the lower end of each leg member, said assembly comprising a pair of skis, each ski comprising a runner having upwardly curved ends, a central flat upper surface, and being long enough to support the pair of wheels on one side of the stroller; each ski having two longitudinally spaced, downwardly curved indentations extending below the upper surface of the ski and being spaced apart for receiving the lower portions of said pair of wheels; a pair of longitudinally extending, parallel, vertical stop members, one stop member being positioned on each side of each said indentation; and a pair of elastic straps, one end of each strap being anchored centrally on the upper surface of the runner and the other end of each strap having an open hook for releasably engaging the lower end of one of said pair of leg members, wherein when said hooks are engaged with said leg members, the open portions of said hooks are facing in opposite lateral directions and each pair of wheels are held in position on the ski by opposing elastic tension forces on said leg members.

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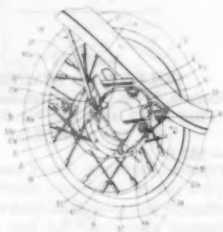
4,479,658

## WHEELBARROW WITH BRAKING SYSTEM

David Michaux, 401 Staircase, Lenoir, N.C. 28645

Filed Jan. 4, 1982, Ser. No. 385,280
Int. Cl.³ B62B 1/18
U.S. Cl. 280—47.31 13 Claims



1. A wheelbarrow, which comprises:
(a) a frame;
(b) a pan attached to the frame;
(c) a wheel, rotatably mounted to the frame, which includes a hub;
(d) a brake disposed within the hub;
(e) means comprising a backplate abutting the hub for enclosing the brake within the hub to hinder the entry of foreign matter;
(f) actuator means linked to the brake for bringing the brake into contact with the hub;
(g) a plate attached to the backplate and having a notched tab;
(h) an axle attached to and extending through the plate and the backplate, first and second brackets securing the axle to the frame, the hub being journaled about the axle;
(i) wherein the actuator means comprises:
(f1) a third bracket, attached to the frame, having a threaded stud and a hole extending longitudinally therethrough;
(f2) a lever pivotally attached to the third bracket;
(f3) a cam abutting the brake;
(f4) an arm attached to the cam and pivotally attached to and passing through the backplate and the plate;
(f5) a fourth bracket attached to the plate having a threaded stud and a hole extending longitudinally therethrough; and
(f6) a flexible cable having a sheath and an inner cable member, the sheath attached at its first end to the threaded stud of the third bracket and at its second end to the threaded stud of the fourth bracket, the inner cable member passing through the threaded stud of the third bracket, through the sheath, and through the threaded stud of the fourth bracket, and attached at its first end to the lever and attached at its second end to the arm; and
(j) a rod attached to the frame and engaging the notched tab of the plate to prevent the plate and the backplate from

rotating when pressure applied to the lever is transmitted by the inner cable member to the arm.

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**4,479,659**

## CYCLE

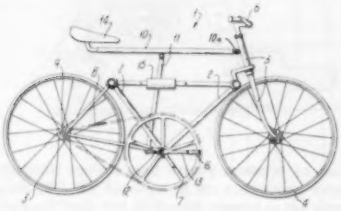
George H. C. Hung, 4 Seymour Rd., Block K, Merry Terrace, Hong Kong

Filed Aug. 25, 1982, Ser. No. 411,537

Claims priority, application United Kingdom, Aug. 27, 1981, 8126222

Int. Cl.³ B62M *1/20*

U.S. Cl. 280—226 R 9 Claims



1. A cycle which comprises rotatable crank means having an axis of rotation, a drive wheel axle, at least one drive wheel rotatable in response to rotation of the crank means, the position of the axis of rotation of the crank means being fixed with respect to the drive wheel axle, pedal means mounted on the crank means for effecting rotation of the crank means, a saddle which is pivotally movable about a pivot point, the position of which is fixed in relation to the drive wheel axle, and means for transmitting a force from the saddle to the crank means to effect rotation of the crank means such that continued rotation of the crank means may be effected by the application of a force alternately to the pedal means and to the saddle, said force transmitting means acting on said crank means on one side of the axis of rotation of said crank means and said pedal means being mounted on said crank means on the other side of said last-mentioned axis of rotation.

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**4,479,660**

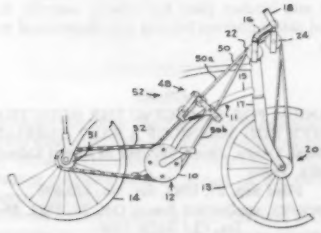
## TWO WHEEL SYNCHRONOUSLY DRIVEN BICYCLE

Daniel J. Pattison, 5204 Myer Ct., Rockville, Md. 20853

Filed Sep. 30, 1982, Ser. No. 430,046

Int. Cl.³ B62M *1/02*

U.S. Cl. 280—261 2 Claims



1. A two wheel, synchronously driven bicycle comprising a frame, a rear wheel, foot powered drive means for said rear and front wheels, a fork member whereby said front wheel is rotatably mounted on said frame, said fork member provided with an upwardly disposed steering post, said frame rotatably receiving said steering post to permit steering of said front wheel, said foot powered drive means mounted on said frame having first and second sprocket means, both of said first and second sprocket means being coupled to be rotatably driven by said foot powered drive means, said rear wheel having a third sprocket means connected thereto, said front wheel having a fourth sprocket means connected thereto, first and second endless coupling means respectively interconnecting said first sprocket means and said third sprocket means of said rear wheel and said second sprocket means and said fourth sprocket means of said front wheel, and mounting means on said steering post for receiving leading and trailing portions of said second coupling means for directing said second coupling means from said second sprocket means to said fourth sprocket means of said front wheel in a manner to permit steering of said front wheel and to avoid interference of said second coupling means with said frame, said mounting means comprising first and second pulleys mounted adjacent each other on a common axis, said first and second pulleys for receiving respectively said leading and trailing portions of said second coupling means and means for suspending said first and second pulleys from said steering post to permit movement thereof in a direction substantially perpendicular with respect to said frame, thereby permitting rotation of said steering post and steering of said front wheel.

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**4,479,661**

## FORK BAR FOR MOTORCYCLES

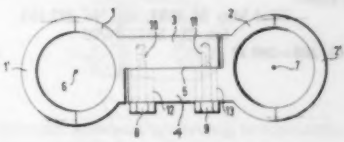
Richard Weigl, Schrobenhausener Str. 56, D-8897 Pöttmes, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,285

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 8120152[U]

Int. Cl.³ B62K *25/08*

U.S. Cl. 280—279 13 Claims



1. A fork bar for motorcycles comprising:

(a) a pair of independently clamped clamps for surrounding corresponding fork halves of the motorcycle,

(b) a crossbrace,

(c) laterally adjustable means for rigidly locking the crossbrace to the clamps, whereby varying distances between the fork halves of different motorcycles can be rigidly bridged by the same crossbrace.

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**4,479,662**

## METHOD AND MEANS FOR ASSEMBLING THE PARTS OF CYCLE FRAMES AND THE LIKE

Paule Defour, and Antoine Dumas, both of Loire, France, assignors to Angenieux CLB S. A. and Ateliers De La Rive, both of, France

Continuation-in-part of Ser. No. 234,625, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 54,962, Jul. 5, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,446

Claims priority, application France, Jul. 31, 1978, 78 23045

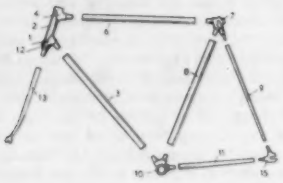
Int. Cl.³ B62K *19/06, 19/22*

U.S. Cl. 280—281 R 12 Claims

1. A bicycle frame comprising frame elements made of a lightweight tubular material, the frame elements comprising fittings and tubes, said fittings being hollow and having a circular or oval cross section for mounting and assembling the frame, the fittings having a plurality of conical male bearings having branches giving precise angular position, the fittings being made of a single piece of light metal alloy; the tubes being made of a light metal alloy and having at each extremity an opening with a conicity of pitch of about three degrees

corresponding to the conicity of the male joints; wherein the ends of the tubes are secured adhesively to truncated bearings in the ends of the tubes;

the ends of the tubes for assembling the fittings to the tubes of the frame having inside bearings with an increase taper section up to the end corresponding to the male assembly bearings of the fittings;



the ends of the male bearings being conical and in the form of a whistle;

the sections of the male assembly bearings of the fittings and the sections of the inside bearings at the ends of the tubes may be circular, oval, triangular, or polygonal; and

at least one of the male conical bearings including inside reinforcing means.

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**4,479,663**

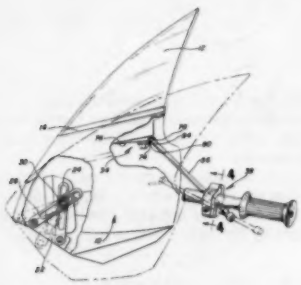
## HANDLEBAR MOUNTING FOR A FAIRING

**Lewis R. Morris; Timothy M. Sullivan, and James L. Sharp, all of c/o First Champaign Corporation, P.O. Box 927, Rantoul, Ill. 61866**

**Filed May 26, 1982, Ser. No. 382,183**

**Int. Cl.³ B62J *17/02***

**U.S. Cl. 280—289 H** **16 Claims**



1. In a mounting for a fairing on a motorcycle having a steerable front wheel assembly with handlebars extending laterally therefrom and a headlight carried on the front wheel assembly between laterally spaced bolts defining a lateral axis, the improvement comprising:

a pair of rods secured to an upper portion of the fairing and extending downwardly and rearwardly therefrom;

a pair of clamps for connection with the motorcycle handlebars, said clamps receiving said rods, the length and orientation of the rods between the clamps and the fairing being adjustable; and

means connecting a forward, lower portion of the fairing with said laterally spaced bolts, said means accommodating fore-and-aft movement of said fairing relative to said headlight so that said fairing can be adjustably positioned longitudinally relative to the headlight and rotation about said lateral axis of the fairing with respect to the headlight so that the fairing can be mounted on motorcycles having different configurations and is adjustable angularly with respect to the motorcycle.

**4,479,664**

## SKI SAFETY BINDING

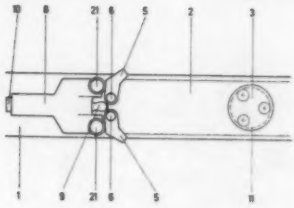
**Ullrich Gertsch, Matten, Switzerland, assignor to E. and U. Gertsch AG, Ski-Produkte, Interlaken, Switzerland**

**Continuation of Ser. No. 47,701, Jun. 12, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,532**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825876**

**Int. Cl.³ A63C *9/08***

**U.S. Cl. 280—618** **6 Claims**



1. A safety ski binding comprising:

a binding plate for supporting the sole of a ski boot;

pivot bearing means for non-detachable fixing of said binding plate to a ski with an upper surface of said binding plate parallel to an upper surface of the ski, said binding plate being rotatable about said pivot bearing means between a normal skiing position and a laterally pivoted position in the event of a torsional fall of the skier,

means for releasably holding said binding plate in said normal skiing position;

first binding means for holding the heel of the ski boot mounted on said binding plate at the rear end of said binding plate;

second binding means for holding the sole of the ski boot mounted on said binding plate at the forward end of said binding plate;

one of said first and second binding means comprising two separate holder elements for holding the ski boot at opposite sides of the lengthwise axis of the binding plate, each of said holder elements being mounted on the binding plate for rotation about an axis extending substantially perpendicular to the upper surface of the binding plate; and

means for locking each holder element in a holding position, when the binding plate is in its normal skiing position and for releasing the respective holder element for rotation when said binding plate has rotated laterally out of its normal skiing position beyond a predetermined minimum angle.

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**4,479,665**

## MECHANISM FOR CHANGING THE DIRECTION OF PUSHER ROD MEANS OF A BABY CARRIAGE

**Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan**

**Filed Sep. 27, 1982, Ser. No. 423,696**

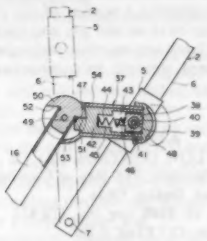
**Claims priority, application Japan, Oct. 26, 1981, 56-172617**

**Int. Cl.³ B62B *7/06***

**U.S. Cl. 280—644** **13 Claims**

1. A mechanism for changing the direction of pusher rod means (2) of a baby carriage, said pusher rod means (2) being pivotally supported by a first fixed point (7) on the body of the baby carriage, the direction of the pusher rod means (2) being changed by a forward and rearward turning thereof, said pusher rod means (2) comprising a pair of slide guide rods (6) extending relatively vertically, said mechanism comprising: a slider (5) slidably guided on each said slide guide rod (6) of said pusher rod means (2), a connecting member (37) having a predetermined length, its opposite ends being pivotally con-

nected to said slider (5) and a second fixed point (49) on the body of the baby carriage, respectively, a stopper (42) mounted to be slidable along the longitudinal direction of said connecting member (37), and a stop plate (50) formed with first and second recesses (51) and (52) engagable with one end (47) of said stopper (42) at different positions back and forth on its



circumferential surface, and fixedly mounted to said second fixed point (49), the direction of the connecting member (37) being changed back and forth with respect to the second fixed point (49) in response to the engagement of the stopper (42) with either the first recess (51) or the second recess (52), whereby the pusher rod means (2) at its changed position is fixed.

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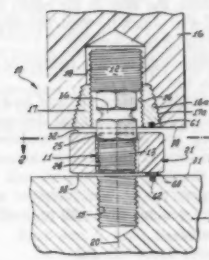
**4,479,666**

## LOAD-LINE FASTENER

**James W. Welsh, 1350 Loring St., San Diego, Calif. 92109, and Robert A. Anderson, 1481 Anita St., Carpenteria, Calif. 93013**

**Continuation of Ser. No. 101,204, Dec. 7, 1979, Pat. No. 4,310,181. This application Dec. 28, 1981, Ser. No. 335,230**
**The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.**
**Int. Cl.³ F16L *35/00***
**U.S. Cl. 285—4** **18 Claims**



1. In a fastening assembly, the combination comprising
(a) an axially elongated fastener having axially spaced differentially threaded portions respectively adapted to threadably engage threaded extents carried on members to be interconnected, and
(b) means at the side of the fastener characterized as facilitating transmission of torque to the fastener to rotate the fastener about said axis whereby said threaded portions are then adapted to threadably interfit said threaded extents to make-up the assembly,
(c) and including one of said members defining an internal recess sunk into the member from an external face thereof, and an annular insert retained in the recess, said insert defining internal threaded extent threadably engaged by one of said fastener threaded portions, the recess having an interior portion spaced further from said member external face than the overall axial length of said one threaded portion of the fastener, at least a part of said one threaded portion also extending into said recess interior portion whereby upon rotation of the fastener to make-up the members the entirety of said one threaded portion of the fastener will be displaced toward said external face but will remain in said recess,
(d) said means including shoulders on said fastener, said shoulders extending generally axially, the fastener maximum diameter at said shoulders being less than the maximum diameter of said one threaded portion of the fastener.

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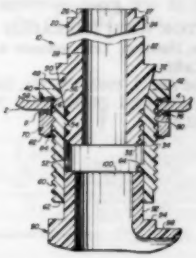
**4,479,667**

## ADJUSTABLE STANDPIPE APPARATUS FOR EVAPORATIVE COOLERS

**Frederick A. Major, deceased, late of Tempe, Ariz.; Henry M. Wolke, Apache Junction, Ariz., and Clare M. Major, executrix, 1725 E. Dr., Tempe, Ariz. 85282, assignors to Clare M. Major, Tempe, Ariz., Executrix for Frederick A. Major**

**Continuation-in-part of Ser. No. 145,974, May 2, 1980, abandoned. This application Apr. 29, 1981, Ser. No. 258,645**
**Int. Cl.³ F16L *35/00***
**U.S. Cl. 285—39** **21 Claims**



15. Pipe connector apparatus, comprising, in combination:
first pipe means, including
an exterior conical portion,
a stem having exterior threads extending continuously for more than 360° disposed adjacent to the exterior conical portion;
second pipe means, including
an interior conical portion for receiving the exterior conical portion of the first pipe means,
a bore disposed adjacent to the interior conical portion for receiving the stem of the first pipe means, and
discontinuous thread means in the bore for receiving the exterior threads of the stem of the first pipe means for urging the two conical portions into a sealing engagement with each other and for securing the first and second pipe means being free of axial overlap and together, the discontinuous thread means including a total arcuate extent in the bore of less than 360°.

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**4,479,668**

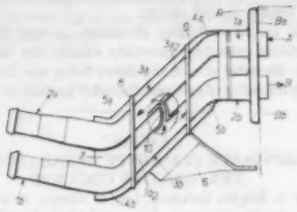
## BENT TUBE AND TUBE ASSEMBLY, PARTICULARLY FOR CONNECTING A HEAT-EXCHANGER TO A CIRCUIT

**Maurice Jacquet, Maurepas, France, assignor to Valeo, France**

**Filed Jun. 23, 1981, Ser. No. 276,659**
**Claims priority, application France, Jul. 1, 1980, 80 14662**
**Int. Cl.³ F16L *39/00***
**U.S. Cl. 285—137 R** **6 Claims**

1. A tube of plastic material for connecting a heat-exchanger to a circuit, said tube comprising at least one inlet section, one outlet section and one median section, said inlet and outlet sections integrally connected by elbows to opposite ends of said median section, said tube consisting essentially of two molded pieces, tightly joined to each other along a straight

parting plane which extends through said median section and elbows along the longitudinal axis of the median section, one of said molded pieces comprising one part of said median section,



a part of one of the elbows, and the entirety of said inlet section, the other of said molded pieces comprising the other part of said median section, a part of another elbow, and the entirety of said outlet section.

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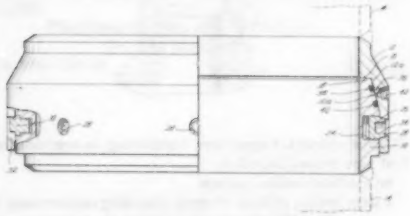
**4,479,669**

## PIPE CONNECTOR WITH THREADED LATCH SCREWS

**Joseph H. Hynes, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.**

**Filed Apr. 1, 1982, Ser. No. 364,392**
**Int. Cl.³ F16L *25/00, 17/00, 21/00***
**U.S. Cl. 285—332.3** **7 Claims**



1. A connector for mechanically securing first and second pipe sections in a desired force transmitting end to end relationship, comprising:

end portions on the first and second pipe sections which are shaped and dimensioned so that the end portion of the first pipe section can be inserted in the end portion of the second pipe section,

stop means for limiting telescopic penetration of the first pipe section relative to the second pipe section, said stop means includes a shoulder formed on an inner surface of the second pipe section and the outer end of the first pipe section which are adapted to engage each other when the first pipe section is inserted in the second pipe section;

cooperating tapered surfaces located respectively on the outer surface of the first pipe section and inner surface of the second pipe section, the tapered surfaces being dimensioned so that when the shoulder and outer end engage each other for limiting relative penetration, a gap is formed between the cooperating tapered surfaces;

one of the pipe sections including a plurality of helically threaded circumferentially spaced holes opening on the side facing the other pipe section;

a corresponding plurality of threaded latch screws with threads for mating with the threads in the holes, the latch screws being shaped and dimensioned to be received into the threaded holes to an extent that the first section can be inserted in the second pipe section;

the other pipe section including a like plurality of circumferentially spaced openings located therein so that when the first pipe section is inserted in the second pipe section the openings will be substantially aligned with the latch screws;

a portion of each latch screw being exposed to the exterior of the second pipe section, and the exposed portion of the latch screws including engaging means so that the latch screws can be engaged and rotated for moving a portion of the latch screws into the substantially aligned openings for longitudinally straining a portion of the pipe section having the openings to close said gap and fully align said openings with the latch screws while preloading the connection to a desired strength for connecting the pipe sections together.

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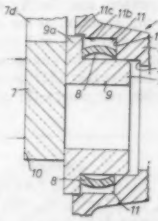
**4,479,670**

## WATER FLOW CONTROL VALVE

**Dieter Gabler, Graben Neudorf, Fed. Rep. of Germany, assignor to Ranco Incorporated, Dublin, Ohio**

**Filed Feb. 19, 1980, Ser. No. 122,523**
**Int. Cl.³ F16K *3/00***
**U.S. Cl. 251—328** **10 Claims**



1. A water flow control valve comprising:

a housing having water inlet and outlet connections;

a plate-like valve shutter having a flow opening;

valve operating means for displacing the valve shutter between an open position in which water can flow through the flow opening from the inlet to the outlet connection and a closed position in which the flow opening is cut off from the inlet and outlet connections;

a pressure member within said housing relative to which the valve shutter slides, and

a tubular resiliently flexible sealing element located within the housing and subjected to an axial deforming force between the housing and said pressure member, to produce elastic deformation of the sealing element with an outwardly-bowed shape in axial section, said deformed sealing element urging the pressure member against the valve shutter while sealing the said pressure member relative to the housing.

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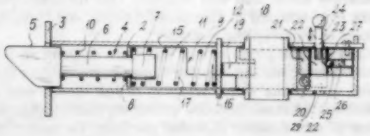
**4,479,671**

## TUBULAR DOOR LOCK WITH A CATCH DEVICE

**Angelo Colombo, Lazzate, Italy, assignor to Valli & Colombo S.p.A., Italy**

**Filed Jul. 8, 1981, Ser. No. 281,412**
**Claims priority, application Italy, Jul. 21, 1980, 22350/80[U]**
**Int. Cl.³ E05C *1/16***
**U.S. Cl. 292—169.14** **1 Claim**



1. In a lock, comprising

a hollow casing,
a sliding element disposed within said casing, said sliding element constituted by a front wall and two side walls,
a bolt affixed to the front wall of said sliding element and adapted to extend and retract through an opening in said casing,
a spring disposed about said bolt for biasing the same in an extended direction,
two lugs, each disposed on a respective side wall of said sliding element,
a second spring disposed within said sliding element and affixed to one end of said bolt, said second spring adapted to bias said bolt and said sliding element in the extended direction,
a transverse element affixed to an end of said second spring opposite the end affixed to said bolt, and
a control member for extending and retracting said sliding element and said bolt, said control member comprising a core extending through said hollow casing and adapted to receive a door handle, and
an arcuate section disposed about said core, whereby when said core is rotated in one or another direction, said arcuate sector engages one or the other of said lugs to cause said sliding element to move against the biasing action of said second spring, and to retract the same and said bolt,
the improvement comprising
a transverse bar engaged with said side walls of said sliding element on a side of said core opposite said arcuate sector,
a block affixed to an inner face of said casing,
a plug mounted within said block for movement between first and second positions, said plug disposed to contact said transverse bar in said first position to retain the same in position, and to permit movement of said transverse bar and of said sliding element in said second position,
a stem affixed at one end to an end of said plug and extending through an opening in said casing,
a knob affixed to the other end of said stem, said stem and knob adapted to control position of said plug between said first and second positions,
a bore disposed in said casing and substantially aligned with an end of said plug opposite the end to which said stem is affixed, said bore adapted to receive an implement for removing said plug from the first position,
an indentation disposed in a side of said plug, and
a ball and spring arrangement disposed within said block to be substantially aligned with the direction of extension and retraction of said bolt and sliding element, and adapted to contact said indentation in the side of said plug to retain the same in the second position.

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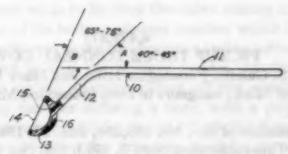
**4,479,672**

## CONTACT LENS INSERTER

**Arthur C. Jermyn, 15914 Overview Rd., Poway, Calif. 92064**

**Filed Jan. 5, 1983, Ser. No. 436,504**
**Int. Cl.³ A61F 9/00**
**U.S. Cl. 294—1 CA** **3 Claims**




1. A contact lens inserter consisting of a single member for viscously holding a contact lens on one end thereof and for placing the contact lens in intimate contact with the eye of a contact lens user, comprising:
a handle having a first generally flat portion engageable by at least two fingers of the user for manipulating the inserter and a second generally flat portion coextensive with and extending from one end of the first portion at an acute angle thereto; and
a contact lens holding means integral with the free end of the second portion, the holding means being generally hemispherical in shape, having a planar surface angularly displaced relative to the second portion at a second acute angle that is smaller than the first-mentioned acute angle, and hollowed to provide a recess for receiving a viscous fluid to hold the contact lens placed on the planar surface with the curved surface thereof extending into the recess and into contact with the fluid.

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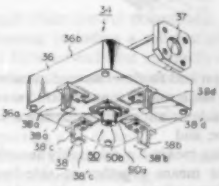
**4,479,673**

## HAND OF AN INDUSTRIAL ROBOT

**Hajimu Inaba; Seiichiro Nakajima, both of Hino; Shinsuke Sakakibara, Kunitachi, and Ryo Nihei, Musashino, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan**

**PCT No. PCT/JP81/00259, § 371 Date Jun. 1, 1982, § 102(e) Date Jun. 1, 1982, PCT Pub. No. WO82/01152, PCT Pub. Date Apr. 15, 1982**
**PCT Filed Sep. 30, 1981, Ser. No. 387,855**
**Claims priority, application Japan, Sep. 30, 1980, 55-135258**
**Int. Cl.³ B25J 15/00**
**U.S. Cl. 294—88** **3 Claims**




1. A hand of an industrial robot for gripping a workpiece of irregular shape, comprising:
a hand base connected to a movable wrist portion of said robot, said hand base having a plate member serving as a palm face;
two pairs of gripping fingers movably mounted on said plate member extending perpendicular to said palm face, said fingers of each pair being arranged symmetrically with each other with respect to the center of said palm face, each pair of said gripping fingers being independently slidably movable toward each other to close and grip said workpiece and away from each other to open and release said workpiece, the opening and closing direction of one pair of said gripping fingers intersecting the opening and closing direction of the other pair of said gripping fingers at a right angle; and
a pair of independently operated fluid cylinders mounted on said hand base and having pistons therein arranged for reciprocative movement, the piston of each cylinder being connected to impart sliding movement to a respective one of each pair of gripping fingers, said one finger of each pair being connected to the other finger of that pair by a pivoting link mechanism to move simultaneously therewith so that each pair of gripping fingers is independently moved by its respective fluid cylinder.

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**4,479,674**

## DEVICE FOR CARRYING ELONGATED ITEMS

**Robert Nordmeyer, Woodland Hills, Calif., assignor to Ski Tote USA, Canoga Park, Calif.**

**Filed Mar. 14, 1983, Ser. No. 475,103**
**Int. Cl.³ A63C 11/02**
**U.S. Cl. 294—147** **27 Claims**

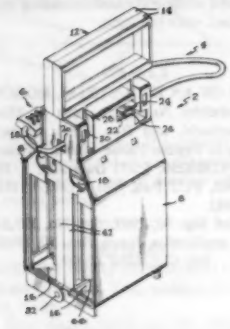
1. A device for conveniently and securely carrying elongated items, comprising:

a first hingeable member having an inner plate means and an outer plate means, said inner and outer plate means defining a first cavity for receiving a first one of said items;

a second hingeable member having means for releasably securing a second one of said items;

hinge means for hingedly connecting a hinged end of said inner and outer plate means of the first member to a hinged end of said second member;

handle means coupled to at least one of said first and second members at a handle end opposite said hinged end thereof;



latch means on said first and second members cooperating to releasably latch said first and second members together in a side-by-side relationship to define a closed position of said device; and

a first securing means for releasably securing said inner and outer plate means together in side-by-side relationship with said inner plate means positioned between said outer plate means and said second member.

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**4,479,675**

## LID ARRANGEMENT FOR LUGGAGE COMPARTMENT

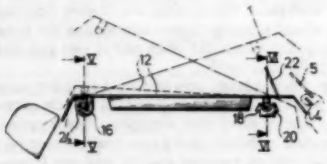
**Kurt O. Zankl, Nauheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 20, 1983, Ser. No. 459,473**

**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203940**

**Int. Cl.³ B60R *3/08***

**U.S. Cl. 296—37.16** **3 Claims**



1. A lid arrangement for a motor vehicle body luggage compartment comprising:

a lid;

a hinge pin attached to the lid and extending from the edge portion thereof;

a socket housing attached to the vehicle body and having an upwardly opening socket adapted to receive and support the hinge pin;

a latch movably carried by the socket housing and having a lug adapted to overlie the hinge pin;

latch spring means urging the movement of the latch to a latching position in which the lug overlies the hinge pin to retain the hinge pin in the housing socket and enable pivotal movement of the lid about an axis defined by hinge pin;

said latch spring means being yieldable to enable withdrawal of the latch lug to an unlatching position to permit removal of the hinge pin from the upwardly open socket of the socket housing; and

second spring means mounted on the socket housing and urging initial upward movement of the hinge pin out of the socket to a position in which the hinge pin holds the latch in the withdrawn unlatching position whereby the lid may be subsequently raised for pivotal movement about a secondary axis spaced from the hinge pin.

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**4,479,676**

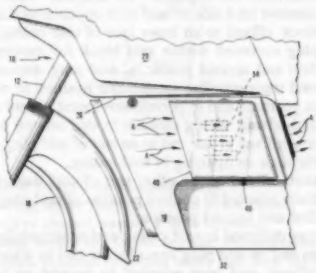
## METHOD AND APPARATUS FOR CHANNELLING AIR THROUGH A MOTORCYCLE FAIRING

**Kenneth W. Hayes, Rt. 4, Box 243, Elizabethtown, Tenn. 37643**

**Filed May 17, 1983, Ser. No. 495,516**

**Int. Cl.³ B62J *17/00***

**U.S. Cl. 296—78.1** **20 Claims**



1. An apparatus for channelling air through openings in a motorcycle fairing, comprising:

an air scoop including an inlet opening for communicating with an interior of the air scoop, the interior being adapted for communication with the openings in the fairing;

mounting means for urging the air scoop against the fairing adjacent to the openings, the mounting means being adapted to permit both rotation of the air scoop through at least 180° and limited movement of the air scoop away from the fairing.

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**4,479,677**

## PICKUP TRUCK TONNEAU COVER

**Ronald S. Gulette, Farmington Hills, and Mark Lobanoff, Troy, both of Mich., assignors to Irvin Industries, Madison Heights, Mich.**

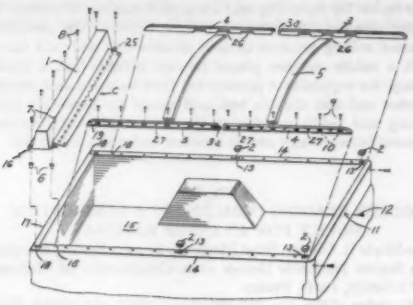
**Continuation of Ser. No. 389,256, Jun. 17, 1982, abandoned. This application Nov. 7, 1983, Ser. No. 549,322**

**Int. Cl.³ B60J *7/06***

**U.S. Cl. 296—98** **3 Claims**

1. Tonneau cover kit for open box of pickup truck comprising a front end transverse housing assembly, means for weather-sealed installation of said assembly at the front end of said box, flexible tonneau cover and spring windup roller means intalled within said housing assembly, side snap rail means for superimposed installation by attachment to the top of box side

walls along the box sides, said rail means including provision for installing removable tonneau supports intermediate the



ends and sides of the box, and interengaging snap means between the side margins of said cover and said snap rail means.

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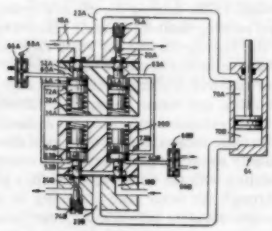
4,479,678

## PNEUMATIC VALVE

Robert M. Sharp, 4358 W. 8th Ave., Vancouver, B.C., Canada (V6R 2A1)

Filed Jul. 24, 1981, Ser. No. 286,421
Int. Cl.³ F15B 13/042
U.S. Cl. 297—71 11 Claims



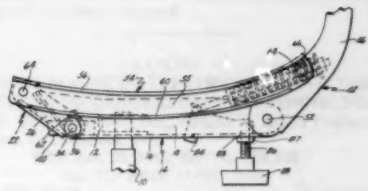
1. A pneumatic valve comprising: a body which is made of metal, and which defines a port, which includes a mouth in a surface of the body, the mouth of the port being formed as a valve seating; a diaphragm which is made of elastomeric material, and is placed so as to lie over the valve seating and adjacent the surface of the body; a plunger member which is moveably mounted adjacent to the diaphragm; a spring acting on the plunger member so that the plunger presses the diaphragm onto the valve seating, thereby sealing off the mouth of the port; a housing member defining a bore, with a part of the housing member against which a seal rubs being formed of a plastic; a piston member, for actuating the plunger member, which piston member is slidably mounted in the bore of the housing member; and a seal made of an elastomeric material and located between the piston member and the bore of the housing; whereby, in use, when air pressure acts on the piston member, the piston member urges the plunger member, against the action of the spring, to a position where the plunger member no longer presses the diaphragm on to the valve seating, thereby opening the mouth of the port.

4,479,679

## BODY WEIGHT CHAIR CONTROL

Bernard J. Fries, Tustin, Calif.; Frederick S. Falks, Greenville, and Donald D. Korell, Ada, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 8, 1981, Ser. No. 271,665
Int. Cl.³ A47C 3/00
U.S. Cl. 297—300 12 Claims



1. A body weight chair control comprising:

a stationary housing including a substantially flat housing pan having a forward end bent upwardly not past a right angle and first and second substantially parallel, spaced housing sides secured to said housing pan;

means for securing said stationary housing to a chair base;

means for supporting a chair back;

first means pivotally mounting said chair back support means to said stationary housing;

a front link including a substantially flat front link pan and first and second substantially parallel, spaced front link sides secured to said front link pan;

second means forward of said first pivotal mounting means pivotally mounting said front link to said stationary housing including a cam axle passing through said first and second housing sides and said first and second front link sides, said cam axle having first and second ends;

means for supporting a chair seat including first and second flat arc-shaped, vertically oriented seat plates each having an upper and lower edge, first and second cam flanges extending laterally from said lower edge of said first and second seat plates respectively, and first and second seat securing flanges extending laterally from said upper edge of said first and second plates respectively;

third means pivotally mounting said chair seat support means to said front link;

fourth means pivotally mounting said chair seat support means to said chair back support means, said first, second, third, and fourth pivotal mounting means being mutually exclusive, said fourth pivotal mounting means located above said first pivotal mounting means;

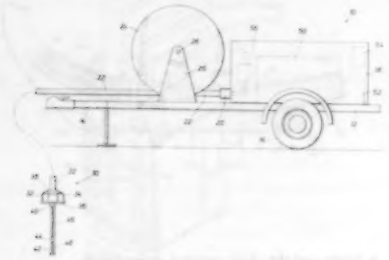
means for restricting movement of said front link such that said front link regardless of its orientation extends upwardly and forwardly from said stationary housing so that said third pivotal mounting means is located above and forward of said second pivotal mounting means, said front link restricting means including first and second cams mounted on first and second extensions of said first and second cam axle ends, said first and second cam flanges contacting said cams if said front link is rotated in a first direction, said means further including said front link pan contacting said housing pan if said front link is rotated in a second direction opposite to said first direction; and

spring means for biasing said chair seat support toward a forward or task position.

## 4,479,680
## METHOD AND APPARATUS FOR ELECTROHYDRAULIC FRACTURING OF ROCK AND THE LIKE

Richard H. Wesley, 19511 Ricelake La., Houston, Tex. 77084, and Richard A. Ayres, 10801 DeWitt Ct., El Cajon, Calif. 92020

Continuation-in-part of Ser. No. 139,438, Apr. 11, 1980, Pat. No. 4,345,650. This application Aug. 11, 1982, Ser. No. 407,066
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ E21C 37/18; E21B 37/08
U.S. Cl. 299—14 5 Claims

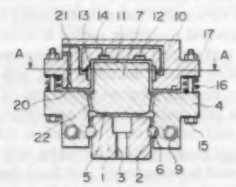


1. A method for in situ fracturing of dense materials such as rock and the like, comprising:
(a) forming a confined receptacle having said dense materials forming a surface thereof;
(b) placing a hydraulic coupling medium within said confined receptacle;
(c) locating an exploding element wire within said confined receptacle and coupling medium, said exploding element wire being in circuit with capacitor means; and
(d) inducing an explosive electrical discharge in the hydraulic coupling medium in close proximity to the dense material by discharging capacitor voltage across said exploding element wire thus developing a shock wave in the hydraulic coupling medium which is transmitted by the hydraulic coupling medium into the dense material as an advancing compressive strain pulse which radiates from the explosive electrical discharge through the dense material until it is reflected by a free surface as a tensile strain pulse, said tensile strain pulse being impedance matched with the dense material such that said tensile strain pulse induces in situ fracturing of the dense material.

## 4,479,681
## TRACK GUIDE BEARING ASSEMBLY

Masayuki Suzuki, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,102
Claims priority, application Japan, Jul. 24, 1982, 57-111608[U]
Int. Cl.³ F16C 29/06, 27/00
U.S. Cl. 308—5 R 4 Claims

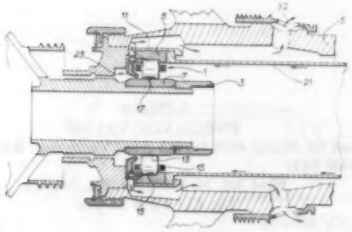



1. A track guide bearing assembly comprising a long track shaft having a plurality of rolling grooves formed axially thereof, a slidable bed having rolling grooves opposed to said rolling grooves of said track shaft in the inner surface of an axial recess for receiving said track shaft therein, a number of rolling members disposed for rolling between the mutually opposed rolling grooves of said slidable bed and said track shaft, a saddle member placed on said slidable bed, a liquid passage for supplying a pressurized fluid between said saddle member and said slidable bed, and means for floatingly supporting said saddle member in the fashion of static pressure disposed between said saddle member and said slidable bed.

## 4,479,682
## ROLLER BEARING COMPRISING A LUBRICATING DEVICE FOR AN INNER RACEWAY

Jean-Marie R. Olivier, Saint Pierre Du Perray, France, assignor to Societe Nationale Detude et de Construction de Moteurs D'Aviation, Paris, France

Continuation of Ser. No. 232,684, Feb. 9, 1981, abandoned. This application Sep. 20, 1983, Ser. No. 533,631
Claims priority, application France, Feb. 12, 1980, 80 03007
Int. Cl.³ F16C 33/66; F16N 7/36
U.S. Cl. 384—475 7 Claims



1. In an intershaft roller bearing for use in a turbojet engine supporting a first rotating shaft for rotation relative to a second rotating shaft, the bearing having an inner race on the first shaft, an outer race mounted in a bore of the second shaft and defining an outer raceway, a plurality of rollers contacting the inner and outer races, and means to supply a lubricant to the outer race, the improvements comprising: (a) a plurality of first holes through the outer race extending in an axial direction and distributed regularly about the periphery of the outer race; the holes communicating with the outer raceway; (b) a plurality of second holes through the outer race extending in an oblique direction and communicating between the outer raceway and means to return lubricant to the lubricant supply; and, (c) means attached to the outer race and communicating with the plurality of first holes to direct lubricant to the inner race to lubricate and cool same, the lubricant being forced through the plurality of first holes and the means to direct it onto the inner race by an increased pressure in a wedge of oil formed in front of the rollers as the rollers rotate with respect to the outer race.

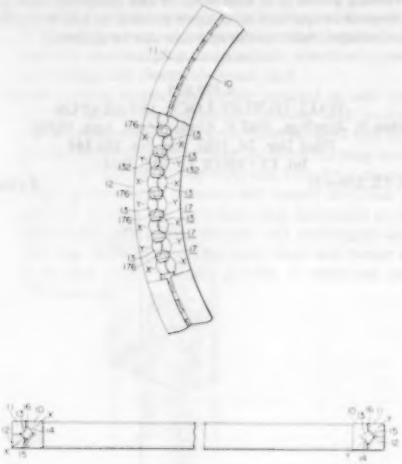
## 4,479,683
## CROSS ROLLER BEARING

Takayoshi Kanamaru, Tokyo, Japan, assignor to Toho Seiko Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,572
Claims priority, application Japan, Mar. 11, 1982, 57-33240
Int. Cl.³ F16C 19/30
U.S. Cl. 384—619 2 Claims

1. A cross roller bearing comprising an inner race having a V-shaped groove with an angle of approximately 90 degrees formed in the outer periphery thereof, a bisplit outer race having a V-shaped groove with an angle of approximately 90 degrees formed in the inner periphery thereof, and rollers disposed circumferentially in said V-shaped grooves in an

alternately crossing manner through spacer retainers, said spacer retainers being each provided at both side ends thereof with curved surfaces perpendicularly intersecting each other, said curved surfaces being each formed as a curved concave surface having a radius of curvature somewhat larger than that



of said roller, with a larger side thickness of a starting edge circle of said curved concave surface being smaller than a smaller side thickness of a terminating edge circle of said curved concave surface, said spacer retainer further having an axially extending oil reservoir through hole formed therein.

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**4,479,684**

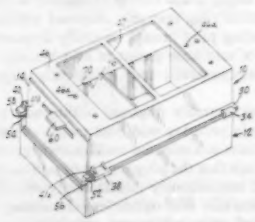
## NESTING DRAWER ASSEMBLY

**John S. Doyel, 404 W. 20th St., New York, N.Y. 10011**

**Continuation-in-part of Ser. No. 374,188, May 3, 1982, abandoned. This application Jun. 25, 1982, Ser. No. 392,357**

**Int. Cl.³ A47B *63/00***

**U.S. Cl. 312—330 R** **11 Claims**



1. A nesting drawer assembly for storing material such as recipe cards comprising:

a drawer bottom with a pair of upwardly extending facing sidewalls flanged at their upper margins and a drawer top with a pair of downwardly extending facing sidewalls with matching flanges along their lower margins, the drawer bottom having at its back end a pair of brackets slideably engaging around the drawer top flanges and the drawer top having at its front end a pair of brackets slideably engaging around the drawer bottom flanges to thereby allow relative back-and-forth sliding movement between the drawer bottom and top, the two pairs of brackets being in each other's path in said movement to limit the extent thereof in the direction of the bottom's forward movement, with the top's flanges being over and riding on the bottom's flanges and with the brackets holding the top and bottom to each other;

said drawer bottom and top being shaped and dimensioned to receive selected flat stock therein when said brackets engage the respective flanges, and at least one of the bottom and top being made of resilient material to allow the sidewalls thereof to be manually deformed to thereby disengage the drawer bottom and top from each other; and

said drawer top and bottom being shaped and dimensioned relative to each other to allow one to nest in the other when so disengaged from each other to thereby reduce the assembly to about half its assembled size to facilitate shipment or storage thereof.

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**4,479,685**

## FLEXIBLE MAGNETIC ELECTRICAL CONNECTOR AND CABLE INCORPORATING THAT CONNECTOR

**Robert A. Kirby, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.**

**Filed Jun. 20, 1983, Ser. No. 505,660**

**Int. Cl.³ H01R *11/30, 25/00***

**U.S. Cl. 339—12 R** **18 Claims**

1. An electrical connector comprising:

at least two flexible, magnetic and substantially electrically non-conductive substrates each having contact means mounted therein with contact faces on a first side of each of said substrates and adapted to meet in face to face contact when said substrates are juxtaposed, each said contact means adapted to accept at least one electrical wire on a second side of said substrates, and

indexing means adapted to permit said at least two substrates to be juxtaposed in a predetermined position.

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**4,479,686**

## CONNECTOR

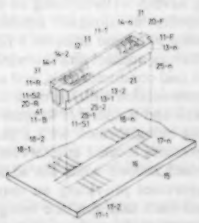
**Mitsuo Hoshino, Atsugi; Osamu Fukushima, Kawasaki, and Toshio Kakuta, Higashiosaka, all of Japan, assignors to Sony Corporation, Tokyo and Hosiden Electronics Co. Ltd., Osaka, both of, Japan**

**Filed Nov. 19, 1982, Ser. No. 443,075**

**Claims priority, application Japan, Nov. 24, 1981, 56-174900[U]**

**Int. Cl.³ H05K *1/06***

**U.S. Cl. 339—17 LC** **6 Claims**



1. A connector comprising:

a connector body formed by an insulating member of substantially rectangular parallelepiped configuration and

having a plug hole made in its front face to extend in its lengthwise direction;

a plurality of contacts arranged in said hole along at least one of two parallel inner side walls of the plug hole in its lengthwise direction;

a plurality of contact terminals respectively connected to said contacts and led out on at least one of two parallel side surfaces of the connector body parallel to its lengthwise direction, said contact terminals extending along the side surface in the direction of insertion of a plug into the plug hole; and

insertion depth setting means formed on the outer peripheral surface of the connector body for controlling the depth of insertion of the connector body in a plurality of stages when that portion of the connector body on which the contact terminals are formed is inserted into an insertion hole made in a printed-circuit board on which the connector is to be loaded;

each of said contacts and each of the corresponding contact terminals being formed as a unitary structure comprising a substantially U-shaped resilient conductor strip an intermediate portion of which is fixedly buried in the connector body by molding, one end portion of each of said resilient conductor strips constituting the contact terminal portion of said strip, said one end portion being embedded in said connector body with the outer surface of said one end portion being exposed in substantially flush relation to the side surface of said connector body.

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**4,479,687**

## ELECTRICAL DISTRIBUTION SYSTEM

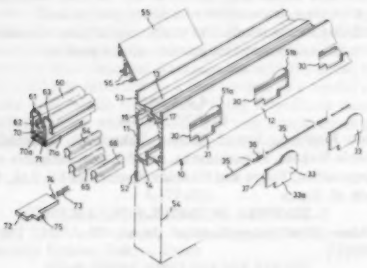
**Michael Humphreys, London, and John A. Rolfe, Tring, both of England, assignors to Electrak International Limited, London, England**

**Filed Oct. 26, 1981, Ser. No. 314,819**

**Claims priority, application United Kingdom, Oct. 28, 1980, 8034663; Jul. 1, 1981, 8120340**

**Int. Cl.³ H01R** *9/00, 13/44*

**U.S. Cl. 339—22 B** **9 Claims**



1. An electrical distribution system comprising the combination of a casing having walls defining an elongate rectangular housing; a plurality of elongate conductor rails mounted within the housing to extend adjacent a first wall thereof; and a contact plug having contact pins intended for making electrical contact with said conductor rails, said conductor rails being of a constant cross-section which is open in the direction away from the first wall and is operable to receive said contact pins; and said housing being formed with a plurality of longitudinally spaced apertures located at intervals in a second wall of said housing which second walls lies adjacent said first wall, each of said apertures providing an entry point for a said contact plug and each said aperture being defined, at least in part, by an arcuate guide surface co-operable with a corresponding arcuate guide surface formed on said contact plug whereby on insertion of a said contact plug in an aperture, rotation causes the contact pins of said plug to pass into the open section of said conductor rails and make electrical contact therewith; and safety closure means associated with each said aperture disposed within said housing, each said safety closure means comprising at least one closure element movable on rotation of said contact plug from a closed position preventing access to at least some of said conductor rails from the respective aperture to an open position in which access to the conductor rails via the aperture can be achieved.

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**4,479,688**

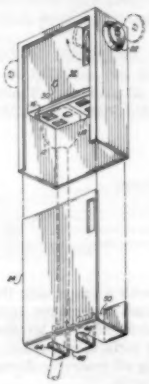
## WALL OUTLET LOCK APPARATUS

**Gordon B. Jennings, 2562 E. Glade, Mesa, Ariz. 85204**

**Filed Dec. 24, 1981, Ser. No. 334,148**

**Int. Cl.³ H01R** *13/502, 13/44*

**U.S. Cl. 339—37** **9 Claims**



1. An electrical wall outlet plug lock apparatus for locking an electrical appliance plug at an electrical wall outlet comprising:

a housing enclosure means including a base means and selectively removable security cover means;

at least one electrical plug recepticle operatively coupled within said housing enclosure means for removably receiving at least one electrical appliance plug therein for completing an electrical circuit conection therebetween;

a master electrical plug operably disposed within said base means including plug prongs operably disposed through the bottom of said base means of said housing enclosure means for mechanically and electrically engaging said wall outlet;

fastening means operably disposed within said base means for operatively securing said base means of said housing enclosure means to a selected wall location proximate said wall outlet such that the plug prongs of said master electrical plug are continuously mechanically and electrically coupled within said wall outlet for maintaining a continuous supply of electrical power therebetween until the housing enclosure means is removed from the wall;

power transfer means operably disposed within said housing enclosure means and electrically coupled between said at least one electrical plug receptacle and said master electrical plug for transfering electrical power from said master electrical plug to said at least one electrical plug receptacle;

said housing enclosure means further including means for operatively covering said base means with said selectively removable security cover means for preventing said at least one electrical plug from being removed from said housing enclosure means and for concealably protecting said fastening means from being unfastened for preventing the removal of said housing enclosure means from said selected wall location and preventing the mechanical and

electrical uncoupling of said plug prongs of said master electrical plug from said wall outlet;

first locking means for selectively securing said selectively removable security cover means to said base means to prevent tampering and the like;

electrical switching means operatively disposed in an electrical circuit between said master electrical plug and said at least one electrical plug receptacle for selectively opening and closing said electrical circuit; and

second locking means operatively coupled to said power transfer means for selectively closing said switching means to complete an electrical path between said master electrical plug and said at least one electrical plug receptacle and for selectively opening said switching means for breaking the circuit between said master electrical plug and said at least one electrical plug receptacle so as to selectively electrically energize and deenergize said at least one electrical plug receptacle from said master electrical plug to prevent the transfer of electrical power therebetween.

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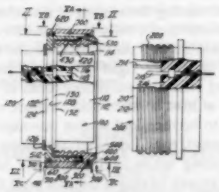
**4,479,689**

## COUPLING NUT FOR AN ELECTRICAL CONNECTOR

**David J. Marmillion, Bainbridge, and Robert W. Brush, Sr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Sep. 30, 1982, Ser. No. 430,892**
**Int. Cl.³ H01R *13/629***
**U.S. Cl. 339—89 M** **12 Claims**



1. A coupling nut for an electrical connector of the type having first and second shells (100, 200), the coupling nut adapted to be rotatably mounted to the first shell (100) and adapted to be connected to the second shell (200) by engaging a pair of first threads (420, 220) operating between the second shell and the coupling nut, the coupling nut characterized by:

two coupling sleeves (400, 500) threadedly interconnected at respective adjacent ends by second threads (430, 530), said coupling sleeves being adapted to undergo axial movement upon relative rotation between said second threads to tighten engagement between the first threads, one of said coupling sleeves (400) including one said first thread (420) and said second threads (430, 530) being of opposite helical sense than said first threads (420, 220); and

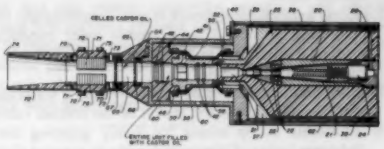
drive means (600, 700) for driving the coupling sleeves between first and second angular positions whereby said respective first and second threads undergo relative axial movement for tightening.

**4,479,690**

## UNDERWATER SPLICE FOR SUBMARINE COAXIAL CABLE

**Alan T. Inouye, Ventura; Jeffrey V. Wilson, Camarillo; Wayne R. Tausig, and Thorndyke Roe, Jr., both of Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed Sep. 13, 1982, Ser. No. 417,740**
**Int. Cl.³ H01R *4/00***
**U.S. Cl. 339—94 C** **15 Claims**



1. An electrical underwater splice device for direct connection with a prepared end of a submarine coaxial cable of the type consisting of a center conductor/strength member and a concentric outer shield conductor separated by an inner concentric dielectric layer and having an outer dielectric jacket, and which has the end thereof prepared in a stepped manner such that the center conductor/strength member projects beyond the end of the inner concentric dielectric layer, the inner concentric dielectric layer is step-shaped and extends beyond the end of the concentric outer shield conductor, and the concentric outer shield conductor extends beyond the end of the outer dielectric jacket to permit the end of the coaxial cable to interface and make connection with the interior of the splice device upon being inserted therein, comprising:

a. a female protective housing having a central opening therein and a longitudinal axis;

b. a female inner conductor and strength restoration means within and concentric along the longitudinal axis of said female protective housing having an entrance opening and which includes a first electrical contact means for making suitable electrical connection with and means for securely gripping the center conductor/strength member of the coaxial cable to prevent the back-out thereof;

c. a female outer conductor disposed within said female protective housing concentric with said inner conductor and strength restoration means;

d. a portion of said female outer conductor projecting longitudinally outward from one end of said female inner conductor and having a termination end which includes a second electrical contact means for making suitable electrical connection with the concentric outer shield conductor of the coaxial cable;

e. female inner dielectric means disposed between said female inner and outer conductors for providing electrical insulation therebetween and having an end thereof shaped to interface with the step-shaped inner concentric dielectric layer of the coaxial cable;

f. female outer dielectric means disposed between said female outer conductor and said female protective housing;

g. pressure compensating reservoir means disposed between said female outer conductor and said female protective housing;

h. dielectric pressure compensating fluid channels provided between said female inner conductor and strength restoration means and said pressure compensating reservoir, and between said longitudinally outward projecting portion of said female outer conductor and said pressure compensating reservoir;

i. said female outer dielectric means including longitudinal parallel grooves which allow for movement of pressure compensating fluid from said female inner conductor and strength restoration means to said pressure compensating reservoir means;

j. a pierceable end cap means mounted over the central

opening to said female protective housing; said pierceable end cap means including a central passageway having a first wiping seal at the outer end thereof and a second wiping seal at the opposite end thereof, the space between said first and said second wiping seals being filled with a semi-mobile dielectric material which is forced out of the end cap means when displaced by the coaxial cable;

k. first hermetic seal means in said female inner conductor and strength restoration means for forming a watertight seal about the center conductor/strength member of said coaxial cable;

l. second hermetic seal means in said longitudinally outward projecting portion of said female outer conductor for forming a watertight seal with the inner concentric dielectric layer of the coaxial cable;

m. third hermetic seal means for providing a watertight seal with the outer dielectric jacket of the coaxial cable;

n. adjustable clamp means for firmly gripping the outer dielectric jacket of the coaxial cable to prevent slipping of the outer jacket on said coaxial cable;

o. all otherwise void spaces within said female protective housing central opening between the second wiping seal on said pierceable cap means and the end of said female inner conductor and strength restoration means including voids within said pressure compensating reservoir and said fluid channels being filled with dielectric pressure compensating fluid;

p. seawater passage means in said female housing to allow seawater pressure against said pressure compensating reservoir for pressure compensation purposes without allowing seawater into the dielectric pressure compensating fluid;

q. check valve means between said female inner conductor and strength restoration means and said fluid channels to said pressure compensating reservoir; said check valve means operating to prevent back-up of dielectric pressure compensating fluid from said pressure compensating reservoir means back into said female inner conductor and strength restoration means;

whereby upon insertion of the prepared end of the coaxial cable into the underwater splice device, the center conductor/-strength member pierces each of the two wiping seals and displaces the semi-mobile dielectric material of said end cap means operating to force away any seawater that may adhere to the coaxial cable center conductor and then continues through the dielectric pressure compensating fluid to the inner conductor and strength restoration means where it makes electrical connection with said first contact means, engages said first hermetic seal means and is secured by said gripping means; said dielectric pressure compensating fluid, as it is displaced, also operating to assist said wiping seals and semi-mobile dielectric material to remove any seawater from the splice, and upon said first hermetic seal means engaging said center conductor/strength member said dielectric pressure compensating fluid inside the inner conductor and strength restoration means being forced to flow through said check valve means and said fluid channels to said pressure-compensating reservoir; said second hermetic seal means simultaneously engaging the inner concentric dielectric layer of the coaxial cable while excess dielectric pressure compensating fluid is forced to flow through said fluid channels from said longitudinally outward projecting portion of the female outer conductor to said pressure compensating reservoir; said third hermetic seal means also simultaneously engaging the outer dielectric jacket of the coaxial cable and forcing very little if any remaining dielectric pressure compensating fluid to hose up the coaxial cable between the concentric outer shield conductor and outer jacket, and said second electrical contact means making electrical connection with said coaxial cable concentric outer shield conductor, thus permitting reliable electrical and mechanical undersea splice repair of coaxial cable.

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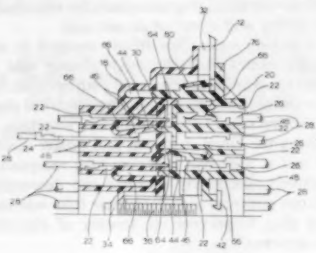
**4,479,691**

## CONNECTOR ASSEMBLY

**Frank L. Smith, Jr., Naperville, Ill., assignor to Molex Incorporated, Lisle, Ill.**

**Filed May 12, 1983, Ser. No. 493,854**
**Int. Cl.³ H01R *11/01***
**U.S. Cl. 339—59 M** **7 Claims**



1. A connector assembly including

a pair of mateable connector halves, each connector half having a housing with a plurality of terminal receiving cavities formed therein facing opposing cavities formed in the housing of the other connector half, each cavity having a wall,

a group of terminals mounted in said cavities along side of the wall, the terminals mounted in said opposing cavities being in alignment with one another to define mateable terminal pairs, and

terminal locking means cooperating between each terminal and the wall of its respective cavity to lock said terminal therein, said locking means having means interengaging between said cavity wall and the terminal only when said terminal is fully inserted within its cavity,

whereby the terminal pairs are mated when the connector halves are moved together,

the improvement in said connector assembly including means for preventing the mating of the connector halves if any one terminal is not fully inserted into its corresponding cavity, said mating prevention means comprising:

a plurality of relatively rigid polarizing projections integrally formed with and extending from at least one housing between at least some of said cavities, said projections are adapted to be received within corresponding recesses formed adjacent each terminal receiving cavity in the opposite housing when said connector halves are fully mated, each recess having a flexible wall that is common with the adjacent cavity, said flexible wall being movable towards the interior of the recess when the terminal in the adjacent cavity is not fully inserted therein preventing the receipt of the corresponding projection in said recess, whereby the connector halves cannot be mated if any one projection cannot be received in its corresponding recess.

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**4,479,692**

## RECEPTACLE FOR FLAT MULTICONDUCTOR CABLE

**William S. Greenwood, Nutley; Karl Weinmann, Watchung, and Reinhold Weindel, Clinton, all of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.**

**Filed Jan. 7, 1982, Ser. No. 337,661**
**Int. Cl.³ H01R *13/39***
**U.S. Cl. 339—99 R** **28 Claims**

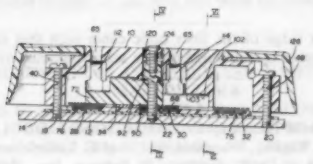
1. A receptacle for use with flat conductor cable and adapted for placement thereof on top of said cable in disposition spanning respective laterally spaced live grounding and neutral conductors extending longitudinally in said cable and being cooperatively securable to a support member underlaying said cable, said receptacle comprising

an elongated body having a cable engaging bottom side and a power transfer access top side,

contact means associated with said live and neutral conductors of said cable carried in said body and including first insulation piercing contact portions disposed at the body bottom side and effective when said body is urged downwardly against said cable during securement thereof to said support member to pierce cable insulation covering said live and neutral conductors, said contact means including second contact portions extending from the first portions toward the top side of said body and positioned within said body such as to be electrically connectively engaged by the contact members of a plug connector when said plug connector is receptively engaged in said receptacle at the top side thereof,

said body having a recess opening upwardly therein from the bottom side,

a support block receivable in said recess and moveable upwardly and downwardly therein relatively of said body,



contact means associated with said cable grounding conductor carried on said support block and having a first insulative piercing contact portion disposed in facing relation to said cable and a second contact portion extending toward the top side of said body when said block is received in said recess with said second contact portion being positioned such as to be electrically connectively engaged by a grounding contact member of said plug connector, and

means for urging said support block and the cable grounding conductor associated contact means carried thereon downwardly relatively of said body independently of the effect of any downwardly urging securement of said elongated body to said support member thereby to cause said grounding conductor associated contact means first portion to pierce the covering over said cable grounding conductor and electrically conductively contact said cable grounding conductor.

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**4,479,693**

## DEVICE FOR DETACHABLY ATTACHING ELECTRIC APPLIANCES

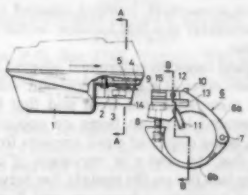
**Takashi Uyeda, and Masaaki Matsumoto, both of Sakai, Japan, assignors to Tsuyama Mfg. Co., Ltd., Japan**

**Filed Aug. 2, 1982, Ser. No. 404,313**

**Claims priority, application Japan, Aug. 7, 1981, 56-117915**

**Int. Cl.³ H01R *13/627***

**U.S. Cl. 339—119 R** **2 Claims**



1. A device for detachably attaching an electric appliance to a frame, including a handle bar pipe, said electrical appliance comprising a casing adapted to have therein suitable electric components, said casing being provided at one side with a pair of first opposed grooves which receive a pair of resilient contacts, one wall of each first groove being defined by a guide member, and a locking resilient plate between the first opposed grooves having therein a locking opening, said device comprising a bracket adapted to be clamped on the handle bar pipe of said frame, said bracket having guide grooves for receiving the guide members on said casing and a pair of inserts secured to said bracket and arranged to be slidingly inserted into said first opposed grooves in the said casing, said inserts each having a contact to be connected to wiring and a sliding surface adapted to be engaged with one of said resilient contacts, said resilient contacts and said inserts resiliently engaging one another within said first opposed grooves, said bracket having a projection to be engageable within said locking opening in said locking resilient plate for detachably locking the casing to the bracket, whereby the wiring circuit is closed or broken simultaneously with attachment or detachment of said casing.

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**4,479,694**

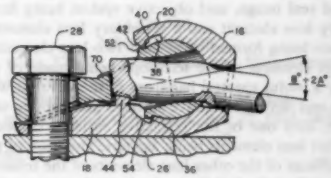
## CABLE CLAMPING DEVICE

**Paul V. Cornell, London, England, and Paul A. Cornell, Knocknore, Ireland, assignors to Pan Electric Corporation, Beverly Hills, Calif.**

**Continuation of Ser. No. 136,413, Apr. 2, 1980, Pat. No. 4,357,068. This application Feb. 19, 1982, Ser. No. 350,328**

**Int. Cl.³ H01R *9/10***

**U.S. Cl. 339—266 R** **9 Claims**



1. A device for clamping a cable, said device comprising:

a generally hook shaped female member including a shank adapted for mounting on a supporting structure and a cable receiving opening through the curve of the hook, said cable receiving opening defining a first clamping surface; and

a male member including a tail and a generally cylindrical head adapted for rotation within the bend of the hook;

said male member defining a generally diametrical cable-receiving bore through said head, which bore is aligned with the tail and extends through said head partially into said tail to form an opening in said tail for receiving the free end of the cable;

said male member defining a second clamping surface adjacent the opening in the tail and a third clamping surface spaced from the opening in the tail;

said shank defining a protruding fourth clamping surface underlying said opening and adapted to fit into the opening to contact said cable therethrough and to deflect said free end of said cable away from the shank, upwardly out of the tail through said opening, said second clamping surface axially spaced from the fourth clamping surface along the length of the cable such that no portion of the second clamping surface overlies the fourth clamping surface when the male member is rotated to a clamping position;

said shank defining a region adjacent to the fourth clamping surface and underlying the portion of the second clamping surface closest to the female member when the male member is rotated to the clamping position, said region shaped to prevent confinement and shearing of the free end of the cable between the second clamping surface and the region

and to ensure that the free end of the cable is clamped only between the first and third clamping surfaces and between the second and fourth clamping surfaces.

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**4,479,695**

## AFOCAL REFRACTOR TELESCOPES

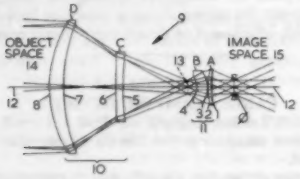
**Iain A. Neil, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland**

**Filed Sep. 3, 1981, Ser. No. 299,200**

**Claims priority, application United Kingdom, Oct. 8, 1980, 8032397**

**Int. Cl.³ G02B *3/00, 15/02***

**U.S. Cl. 350—1.3** **8 Claims**




1. An afocal refractor telescope formed by an achromatic telephoto objective system and a fixed focus eyepiece system aligned on a common optical axis and arranged to provide an internal real image, said objective system being formed by a primary lens element and a secondary lens element and said eyepiece being formed by at least two lens elements, each of the lens elements of the telescope being made of a material having a useful spectral bandpass in the infrared wavelength region and having refractive surfaces intercepting said optical axis, at least one of the refractive surfaces of said primary objective lens elements being aspheric and each of the refractive surfaces of the other lens elements of the telescope being substantially spherical,the aspheric surface possessing only a small degree of asphericity with a maximum aspheric depth of the same order as the wavelengths of said spectral bandpass, the secondary objective lens element being negatively powered and having a refractive index equal to or lower than the refractive index of the primary objective lens element which is positively powered, the telescope having an internal f-number in the airspace between the primary and secondary objective lens elements of the order of 1.0.

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**4,479,696**

## HOUSING FOR INTERFACING A SEMICONDUCTOR DEVICE WITH A FIBER OPTIC CABLE

**Donald L. Lubin, Los Altos; John Uebbing, Palo Alto; Donald A. Shipley, Los Altos Hills, and Rickson Sun, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 166,721, Jul. 7, 1980, abandoned. This application Mar. 24, 1983, Ser. No. 478,217**

**Int. Cl.³ G02B *7/26***

**U.S. Cl. 350—96.20** **6 Claims**

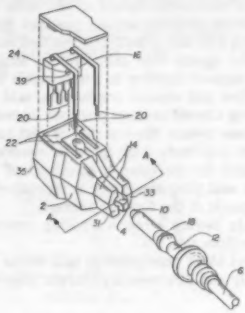
1. An apparatus for interfacing a semiconductor device to a fiber optic cable having an annular ridge, said apparatus comprising a housing having:

a containment section for containing the semiconductor device;

first and second opposed and spreadable jaws extending from the containment section;

a slot formed by the jaws and being in axial alignment with the containment section, said slot being operative for receiving and axially aligning the fiber optic cable with the semiconductor device; and

an annular gap disposed around a portion of the slot and formed by the first and second jaws, the annular gap being bounded on an anterior side by a slanted ridge which is operative for exerting an axial tractive force upon the




annular ridge of the fiber optic cable such that the fiber optic cable is seated against the semiconductor device.

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**4,479,697**

## FIBER OPTICS COMMUNICATIONS MODULES

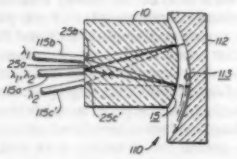
**Narinder S. Kapany, Woodside, and Fred C. Unterleitner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 66,367, Aug. 14, 1979, Pat. No. 4,329,017. This application Nov. 27, 1981, Ser. No. 325,256**

**The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.**

**Int. Cl.³ G02B *7/26***

**U.S. Cl. 350—96.18** **31 Claims**




22. A fiber optics coupler comprising:

a body of optically transparent material having a portion defining a spherical dichroic surface that is substantially reflective for light of a first wavelength and substantially transmissive for light of a second wavelength, said surface being characterized by a self-conjugate plane having the property that a point source of light of said first wavelength in said self-conjugate plane is imaged in said self-conjugate plane;

a first optical transceiver terminal adapted to register an optical transceiver at a first location within said self-conjugate plane;

a second optical transceiver terminal adapted to register an optical transceiver at a second location within said self-conjugate plane separated from said first location, said first and second locations being on opposite sides of a radial axis, being displaced equal amounts from said radial axis such that the center of curvature of said spherical dichroic surface lies on the straight line between said first and second locations, whereupon said first and second locations are conjugate so that a point source of light of said first wavelength at one of said first and second locations is imaged at the other of said first and second locations;

whereupon light of said first wavelength diverging from said

first location is imaged at said second location while light of said second wavelength diverging from said first location passes through said dichroic surface along a first optical path, and whereupon light of said first wavelength diverging from said second location is imaged by said dichroic surface at said first location while light of said second wavelength diverging from said second location passes through said dichroic surface along a second optical path;

mirror means having a portion defining a spherical surface that is at least partly reflective for light of said second wavelength, said mirror means being interposed in said first optical path to reflect light of said second wavelength back through said dichroic surface and image said light thus reflected at a third location proximate said first and second locations; and

a third optical transceiver terminal adapted to register an optical transceiver at said third location to provide optical coupling at said second wavelength between optical transceivers located at said first and third locations.

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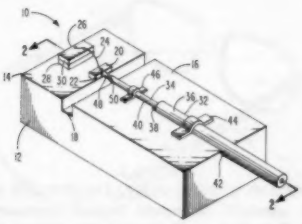
**4,479,698**

## LIGHT EMITTING ASSEMBLY AND A METHOD OF MAKING SAME

**William C. Landis, Lancaster, and Paul Nyul, New Holland, both of Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed May 17, 1982, Ser. No. 379,097**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.20** **8 Claims**



1. In a light emitting assembly comprising a semiconductor light emitting device having an emitting facet, an optical fiber positioned so that light emitted therefrom enters an end face of said fiber and an optical coupling medium between said facet and said end face;

the improvement comprising said optical coupling medium extending between said facet and said end face, having a maximum diameter which is comparable to the diameter of said fiber and tapering in decreasing thickness from said facet and said end face and wherein the spacing between said facet and said end face is between about 0.5 and about 3 times the diameter of said fiber.

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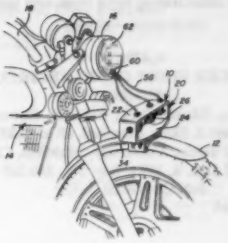
**4,479,699**

## WIND DRIVEN ROTATABLE REFLECTOR FOR VEHICLES

**Richard Bolte, P.O. Box 1745, Wausau, Wis. 54401**

**Filed Mar. 12, 1981, Ser. No. 242,846**
**Int. Cl.³ G02B 5/12**
**U.S. Cl. 350—99** **3 Claims**

1. A wind driven rotatable reflector adapted to be mounted on the front of a motorcycle comprising a hollow body having an open front and rear end adapted to be mounted on the front fender of a motorcycle, a horizontal shaft rotatably journaled in said housing, a plurality of wind driven blades in the form of reflectorized bodies mounted on said shaft for rotation in response to air passing thereover and to provide a flashing effect for observation by persons in front of the motorcycle, said reflectorized bodies including staggered surfaces to provide a flashing effect, means associated with said shaft to maintain its speed below a maximum rotational speed to prevent the surfaces of the reflectorized bodies from becoming a blur which would occur if they rotate too fast, said means for limiting the rotational speed of the shaft including a bore in each end wall of the housing receiving the shaft, a flange on the outer ends of



the shaft to retain it in the housing, and a pair of longitudinal splits in each end of the shaft extending inwardly to enable centrifugal force to move the ends of the shaft outwardly when rotating above a predetermined maximum speed to frictionally engage the periphery of the bore to provide a braking effect on the shaft.

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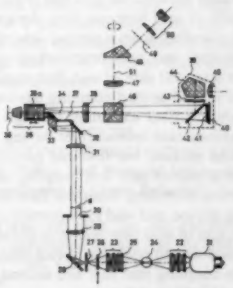
**4,479,700**

## MICROSCOPE

**Kuniomi Abe, 870-72, Aza-Shingahira, Higashitarumi-cho, Tarumi-ku, Kobe, Japan**

**Filed Jun. 10, 1982, Ser. No. 387,164**
**Claims priority, application Japan, Jun. 22, 1981, 56-97320**
**Int. Cl.³ G02B 21/06**
**U.S. Cl. 350—523** **2 Claims**



1. A microscope, arranged to illuminate an object for observation with a source of illuminating light producing a light beam which passes through one half of an objective lens divided in two halves by a split plane substantially including the optical axis of said microscope and to effect magnified observation or photography of said object with an imaging light passing through the other half of said objective lens in a direction opposite to said illuminating light with negligible light scattering which interferes with the image; characterized by an iris fixedly positioned in the vicinity of a point which is conjugate with the entrance pupil of said objective lens and having a configuration conforming substantially with the configuration of said one half of said objective lens for confining incidence of said illuminating light into said objective lens to a part of said one half, a lens system for focusing the light source at the position of the iris, said lens system including a first condenser lens adjoining said light source, a strobotron positioned at the

point of collection of light from said first condenser lens, a thermal protection filter following said strobotron, and a second condenser lens following said thermal protection filter, optical means in close proximity to said objective lens for directing said illuminating light through said lens and means in close proximity to said optical means and said objective lens for shielding said illuminating light from said imaging light.

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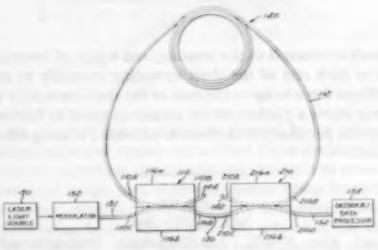
**4,479,701**

## DUAL COUPLER FIBER OPTIC RECIRCULATING MEMORY

**Steven A. Newton, Menlo Park; John E. Bowers, Mountain View, and Herbert J. Shaw, Stanford, all of Calif., assignors to Leland Stanford Junior University, Stanford, Calif.**

**Filed Dec. 1, 1981, Ser. No. 326,215**
**Int. Cl.³ G02B *5/172***
**U.S. Cl. 350—96.16** **31 Claims**



1. A fiber optic recirculating delay line, comprising:
a first optical coupling device;
a second optical coupling device;
a first optical fiber extending through both of said coupling devices, said first fiber having two end portions and an intermediate portion, the first end portion extending from a first side of said first coupling device, the second end portion extending from a second side of said second coupling device, and said intermediate portion extending between a second side of said first coupling device and a first side of said second coupling device;
a second optical fiber extending through both of said coupling devices, said second fiber having two end portions and a loop portion, the first end portion extending from the second side of said first coupling device, the second end portion extending from the first side of said second coupling device, and said loop portion extending between the first side of said first coupling device and the second side of said second coupling device, said coupling devices optically coupling said first and second optical fibers for transfer of light therebetween.

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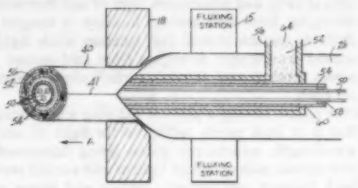
**4,479,702**

## METHOD AND APPARATUS FOR ASSEMBLING A COMPACT MULTI-CONDUCTOR OPTICAL FIBER COMMUNICATION CABLE

**Michael J. Pryor, Woodbridge, and Joseph Winter, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Jul. 6, 1982, Ser. No. 395,443**
**Int. Cl.³ G02B *5/16***
**U.S. Cl. 350—96.23** **30 Claims**

1. An optical fiber communication cable, said cable comprising:
at least one optical fiber;
a tubular cable core surrounding said at least one optical fiber and being radially spaced therefrom; and
said tubular cable core being formed from a composite material having a first layer of high strength metallic material, a second layer of electrically insulating material bonded to



said first layer and at least two electrical conductors bonded to said second layer.

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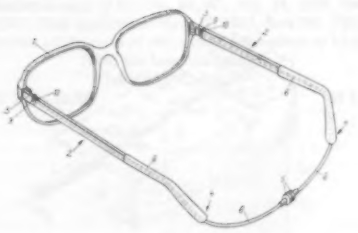
**4,479,703**

## FRAME FOR MULTI-PURPOSE EYEGLASSES

**Klaus Enghofer, Birkenfeld, Fed. Rep. of Germany, assignor to Karl Enghofer Metallwarenfabrik GmbH, Birkenfeld, Fed. Rep. of Germany**

**Filed Dec. 10, 1981, Ser. No. 329,239**
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106562; Sep. 17, 1981, 3137000**
**Int. Cl.³ G02C *5/14, 5/18, 5/20, 3/00***
**U.S. Cl. 351—123** **8 Claims**



1. Eyeglasses having a pair of hollow temple bows, each temple bow having a free end and a hinged end, a retaining means disposed in each temple bow and adapted to be withdrawn from said free end of a respective bow, and characterized by the combination of the following features:
(a) each of said retaining means comprising an elastic cord having one end solidly attached to said hinged end of a respective bow,
(b) each of said elastic cords being disposed in a hollow portion of a respective bow, and
(c) fastening means connected to the ends of said elastic cords adapted to connect said ends of said cords behind the head of a wearer when in an extended state, each fastening means disposed in a recess at the free end of a respective bow when the respective elastic cord is in a non-extended state.

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**4,479,704**

## TRIGGER DEVICE FOR ELECTRONIC FLASH

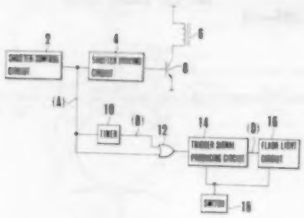
**Makoto Masunaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 382,676, May 27, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,703**
**Claims priority, application Japan, Jun. 18, 1981, 56-94886**
**Int. Cl.³ G03B *15/03***
**U.S. Cl. 354—137** **8 Claims**

1. A trigger device for flash comprising:
shutter control signal producing means for producing a shutter opening and closing operation control signal for

opening and closing an electromagnetically driven shutter;

timer means for producing a delay output signal after the lapse of a certain predetermined time after the timer starts to operate with the shutter opening operation control signal from the shutter control signal producing means; and



flash trigger signal producing means for producing a trigger signal for causing a flash device to emit the flash in response to the shutter closing operation control signal from the shutter control signal producing means or the delay output signal from the timer means whichever is later when both signals are produced.

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**4,479,705**

## FILM TRANSPORTATION DEVICE IN CAMERA

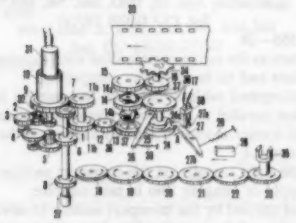
**Hideo Tamamura, Tokyo; Mutsuhide Matsuda, Kanagawa; Toyotosi Suzuki, and Takashi Endo, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 379,449, May 18, 1982, abandoned, which is a continuation of Ser. No. 245,350, Mar. 19, 1981, abandoned. This application Jan. 19, 1983, Ser. No. 459,219**

**Claims priority, application Japan, Mar. 22, 1980, 55-36766**

**Int. Cl.³ G03B *1/18, 19/04***

**U.S. Cl. 354—173.1** **17 Claims**



14. A winding device for a camera, comprising:

a first drive system for performing a single-frame advance in correspondence to a film winding operation by means of a film;

a second drive system for performing a single-frame advance in correspondence to the film winding operation without film; and

means for actuating one of the first and second drive systems.

**4,479,706**

## DISTANCE MEASURING CIRCUIT

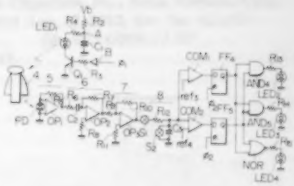
**Akira Takahashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Sep. 3, 1981, Ser. No. 299,291**

**Claims priority, application Japan, Sep. 9, 1980, 55-125168; Sep. 9, 1980, 55-125169; Sep. 9, 1980, 55-125170; Sep. 30, 1980, 55-136366; Sep. 30, 1980, 55-136367**

**Int. Cl.³ G03B *3/00***

**U.S. Cl. 354—403** **2 Claims**



1. A distance measuring circuit comprising:

a light projector means for projecting a light beam toward a target;

a light receiver means for receiving reflected light from said target and outputting a signal;

means for determining the level of said output signal from said light receiver wherein said determining means includes a noise elimination means for eliminating noises in said output signal from said light receiver means by means of a digital processing means, whereby the operation of said light projector means, said light receiver means and said determining means is controlled in a predetermined sequence by a control means; and

a conversion circuit for converting said signal from said light receiver means into a binary digital signal, and wherein said noise elimination means detects the frequency of occurrence of a high level and a low level in the digital signal from said conversion circuit, the high and the low level being in a predetermined zone, and wherein the output of said noise elimination means is determined to be one of a high and a low level in accordance with said frequency of occurrence.

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**4,479,707**

## EXPOSURE TIME REPRODUCING DEVICE

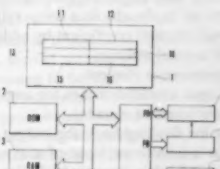
**Masayoshi Kinchi, Tokyo, and Nobuaki Sakurada, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 24, 1982, Ser. No. 410,883**

**Claims priority, application Japan, Aug. 31, 1981, 56-137159**

**Int. Cl.³ G03B *7/093***

**U.S. Cl. 354—426** **3 Claims**



1. An exposure time generating apparatus for a camera having leading and trailing shutter curtains, comprising:

(a) data shift means for expanding a digital datum representing a logarithmically suppressed exposure time value by

shifting the fractional part of the digital datum according to the content of the integral part thereof;

(b) digital data adjusting means for adjusting the shifted digital datum in accordance with an exposure time correction datum;

(c) read-out means for reading out the adjusted digital datum with pulses of predetermined, frequency; and

(d) control means for producing a signal for controlling the trailing shutter curtain when the digital datum read out by the read-out means reaches a predetermined value.

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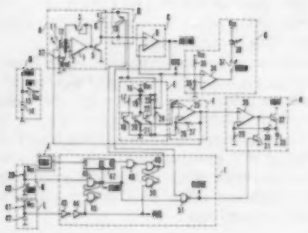
4,479,708

## TEMPERATURE COMPENSATION SYSTEM OF LIGHT MEASURING CIRCUIT

Ryuji Tokuda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,303
Claims priority, application Japan, Jul. 7, 1981, 56-106400
Int. Cl.³ G03B 7/083; G05F 3/08
U.S. Cl. 354—427 4 Claims



1. A temperature compensated exposure control circuit for a camera comprising:

(a) a regulator including a portion for generating a first voltage having a characteristic proportional to an absolute temperature derived from differences between current densities of a pair of transistors and another portion for generating a second voltage having a negative thermal coefficient by utilizing the fact that the voltage across the base-emitter path of a transistor has a negative thermal coefficient, said regulator putting out said first voltage proportional to the absolute temperature and a voltage of very small thermal coefficient by adding said first voltage and said second voltage;

(b) a photosensitive element;

(c) operational amplifier means for amplifying the output of said photosensitive element;

(d) means for feeding back the output of said operational amplifier means to an input of said operational amplifier means, said feedback means including a first semiconductor element for compressing the output of said photosensitive element;

(e) connection means for connecting said first voltage to a non-inverting input terminal of said operational amplifier; and

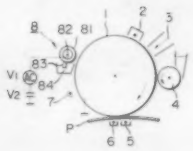
(f) a second semiconductor element for expanding the output of said operational amplifier.

4,479,709

## CLEANING METHOD FOR ELECTROPHOTOGRAPHY AND MEANS THEREFOR

Kastuhiro Syukuri; Satoshi Haneda, and Masahiko Itaya, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1982. Ser. No. 386,341
Claims priority, application Japan, Jul. 24, 1981, 56-116595
Int. Cl.³ G0[illegible] 15/08
U.S. Cl. 355—15 29 Claims




1. In an electrophotography apparatus, an improved cleaning means for removing a residual toner from the surface of an image forming member, said cleaning means being located downstream of a toner transferring area, said cleaning means comprising:

a conductive cleaning member arranged adjacent said image forming member; and

means for applying an alternating electric field between said conductive cleaning member and said surface of the image forming member for causing said residual toner on said surface of the image forming member to move off of said surface and to adhere onto said conductive cleaning member under the influence of forces applied to said residual toner by said alternating electric field; and

illuminating means for illuminating the surface of said image forming member after transferring of a toner image to a recording medium and said alternating electric field is applied so as to eliminate the charge on the illuminated surface portion of said image forming member to facilitate said moving off of said residual toner under the influence of said alternating electric field.

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4,479,710

## APPARATUS FOR STORING, TRANSPORTING AND EXPOSING PHOTOSENSITIVE FILM FOR CAMERA

Quentin D. Vaughan, Hollywood, Fla., assignor to Visual Graphics Corporation, Tamarac, Fla.

Continuation-in-part of Ser. No. 353,637, Mar. 1, 1982,. This application Apr. 11, 1983, Ser. No. 483,915
Int. Cl.³ G03B 29/00
U.S. Cl. 355—28 10 Claims

1. Apparatus for use in combination with a camera having an object plane and an image plane comprising:

a. an elongated table coupled to the camera having a top surface parallel to the image plane of the camera;

b. a film transport section slidably carried on the table at one end thereof;

c. a light tight cassette on the transport section;

d. a supply of imaging film in said cassette;

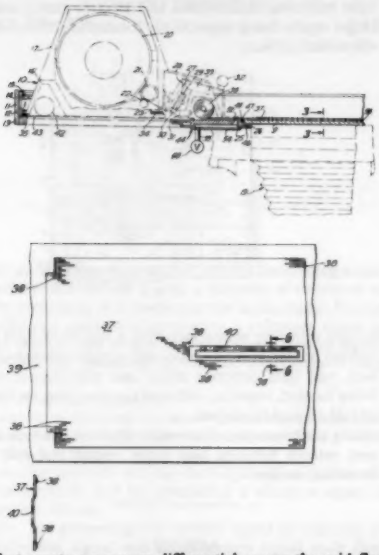
e. means carried by the transport section to advance at least a portion of the imaging film from the cassette on to the table;

f. a transparent platen carried by the table to receive light directed through the camera from the object plane;

g. an elongated flexible sheet of light filtering material yieldably secured at one end within the transport section and adapted to be extended from said transport section along the table to overlie the platen;

h. control means to advance the imaging film across the table and beneath the light filtering material to overlie the platen;

i. a vacuum bar carried by the table adjacent the platen and beneath the elongated flexible sheet;
j. an elongated groove between the platen and the vacuum bar;
k. a fitting to couple a vacuum source to said groove;
l. valve means to control the vacuum source to evacuate air from the space between the flexible sheet and the platen to



first create a pressure differential across the said flexible sheet in the area above the elongated groove to bring the film into contact upon the platen in said area and thereafter squeegee the remaining air out of the space between the flexible sheet and the platen; and
m. means, including said valve means, to interrupt the vacuum source and release the atmospheric pressure against the flexible sheet and the film.

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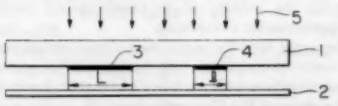
**4,479,711**
**MASK ALIGNER**

**Masao Kosugi, Yokohama; Hiroshi Sato; Kazuo Takahashi, both of Tokyo; Ichiro Ishiyama, and Shuichi Yabu, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 2, 1982, Ser. No. 446,366**
**Int. Cl.³ G03B 27/52**
**U.S. Cl. 355—43** **4 Claims**



1. A mask for use with a mask aligner having means for detecting alignment of said mask with a wafer and means for transferring patterns on said mask to the wafer, said detecting means being capable of resolving patterns having line width less than or equal to l, and said transferring means being arranged to be capable of transferring patterns having line width of L and to be incapable of transferring patterns of line width less than or equal to l, where L is greater than l, said mask having:

an actual element pattern thereon, for transfer by said transferring means to the wafer, said actual element pattern having a minimum line width equal to L, and

an alignment pattern thereon utilized by said detecting means to align said mask and the wafer, said alignment element pattern having a maximum line width equal to l.

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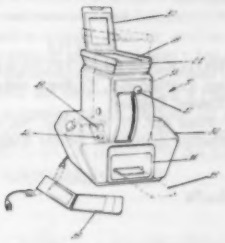
**4,479,712**
**APPARATUS AND METHOD FOR PRODUCING A SELECTED ENLARGEMENT OF A GRAPHIC IMAGE**

**Kenneth D. Pursell, Goleta, Calif., assignor to Prof. Bloodgood's Photographic Emporium, Inc., Santa Barbara, Calif.**

**Filed Aug. 27, 1982, Ser. No. 412,216**
**Int. Cl.³ G03B 27/52**
**U.S. Cl. 355—55** **17 Claims**



1. Apparatus for producing an enlargement of a graphic image comprising

a light tight housing having an extended hollowed out central area and a light tight aperture located at one end thereof which is adapted to receive and pass a graphic image to be enlarged to a predetermined location along the center axis of and at said one end of said hollowed out central area;

a lens shroud including means defining a planar lens support having a fixed focal length lens at the center thereof and sidewalls extending therefrom forming a central cavity on one side of said fixed focal length lens, said lens shroud and said fixed focal length lens being moveably located within said hollowed out central area with said fixed focal length lens located adjacent said predetermined location and said central cavity positioned towards said other end of said hollowed out central area, said lens shroud being moveable within said hollowed out central area over a preselected distance to position said fixed focal length lens at any location within said preselected distance and in alignment with the predetermined location adapted to receive a said graphic image, said lens having a focal length at least equal to said preselected distance;

a gantry housing including sidewalls for defining a passageway which terminates in an opening at one end thereof and a planar mat support at the other end thereof, said gantry housing being positioned within said hollowed out central area and moveable within said housing and with the opening located in slideable light sealing engagement with the lens shroud sidewalls enabling the lens shroud and gantry housing to be moved towards and away from each other and moveable relative to the housing, said planar mat support being located at said other end of said passageway and being adapted to receive and position a strip of material having a base material with a coated surface thereon, which coated surface is responsive to a predetermined quantity of selected actinic radiation to produce an image, said gantry housing being moveable within a second preselected distance to position said planar mat support at any location within said second preselected distance and in alignment with the predetermined location adapted to receive a said graphic image and in alignment with said lens located therebetween, said planar

mat support being adapted to position the coated surface toward and in alignment with said lens; and

differential adjusting means operatively coupled to said lens shroud and to said gantry housing for selectively moving said lens shroud towards and away from said predetermined location to position said lens at a selected location within said preselected distance and for selectively moving said gantry housing towards and away from said predetermined location and relative to said lens shroud to position said planar mat support at a selected location within said second preselected distance enabling said lens to focus an enlarged image of a said graphic image located at said predetermined location onto said planar mat surface, the magnitude of the enlargement being determined by the distance between the lens and the predetermined location and the distance between the planar mat surface and said lens.

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**4,479,713**

## PHOTOGRAPHIC EXPOSURE MASKS

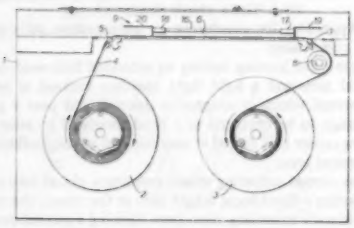
**John G. Long, Leatherhead, England, assignor to Durst (U.K.) Limited, Epsom, England**

**Filed Apr. 27, 1983, Ser. No. 489,201**

**Claims priority, application United Kingdom, Jun. 11, 1982, 8217048**

**Int. Cl.³ G03B *27/58***

**U.S. Cl. 355—74** **9 Claims**



1. An exposure mask for photographic material for automatically determining the distance such photographic material is advanced to match the distance advanced to the size of print being produced, said mask comprising:

a. a positionable covering member forming an edge extending transversely of the direction of photographic material transport and defining an edge of an aperture through which light can reach said photographic material;

b. a measuring wheel for rotation in response to the transport of said photographic material past the mask;

c. switching means for stopping the transport of said photographic material;

d. a switching member movable in a given ratio to the rotational movement of said measuring wheel for operating said switching means to stop the transport of said photographic material; and

e. means responsive to the positioning of said covering member for establishing the ratio of movement of said switching member and said measuring wheel.

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**4,479,714**

## REFLECTION DENSITOMETER WITH ELLIPSOID REFLECTION SURFACE

**Leo K. Lehrer, 1004 Berlin Rd., Cherry Hill, N.J. 08034**

**Filed Apr. 14, 1981, Ser. No. 254,191**

**Int. Cl.³ G01N *21/55***

**U.S. Cl. 356—445** **15 Claims**

1. A reflection densitometer comprising:

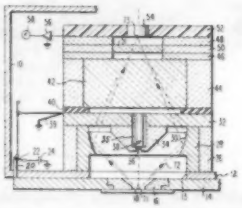
means defining a target region for a specimen whose reflection density is to be measured;

means for directing light to said target region;

electric means for detecting light reflected from a specimen at said target region and for producing a signal proportional to the reflection density of the specimen;

and means for reflecting said light reflected from said target region to said light detecting means;

said light reflecting means including an annular ellipsoidal light reflecting surface, and said electric means and said target region being respectively located at the foci of said ellipsoidal surface;



said light directing means including a source of light in an opaque holder located inside said annular ellipsoidal surface, said light directing means and said electric means being located, together with said target region, on the axis of said ellipsoidal surface,

so that a compact optical assembly of about one inch thickness extends between said target region and said light detecting means.

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**4,479,715**

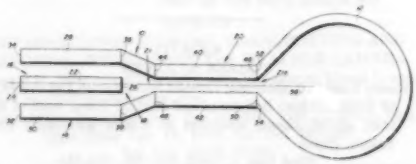
## OPTICAL ROTATION-SENSING INTERFEROMETER WITH (3×3)-(2×2) DIRECTIONAL COUPLER

**Sang K. Sheem, 3105 Tam O'Shanter, Richardson, Tex. 75080**

**Filed Mar. 9, 1982, Ser. No. 356,590**

**Int. Cl.³ G01C *19/64*; G02B *5/14***

**U.S. Cl. 356—350** **9 Claims**



1. A Sagnac ring interferometer for measuring rotation rates of the type for use with a light source for introducing an input light beam into the interferometer and photodetectors for measuring the intensity of the interferometer output beams, said interferometer comprising:

a fiber-optic loop for providing a closed optical path for two counter-propagating light beams and for providing two output beams with a relative phase shift due to rotation in the plane of the fiber-optic loop;

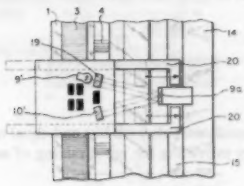
(3×3) optical coupling means for coupling the input light beam into the interferometer, for splitting the input light beam into two input components and for coupling the output light beams to the photodetectors; and

(2×2) optical coupling means, disposed between said (3×3) coupling means and said fiber-optic loop, for coupling the input light beam components into said fiber-optic loop and for coupling the output beams from said fiber-optic loop to said (3×3) coupling means while providing for interference between the output beams.

## 4,479,716
## INCREMENTAL MEASURING INSTRUMENT

Gunther Nelle, Bergen, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,792
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037810
Int. Cl.³ G01D 5/245
U.S. Cl. 356—374 7 Claims



1. In an incremental measuring device comprising a measuring scale which defines a grid, a plurality of reference marks fixedly positioned with respect to the scale, means for sensing the reference marks and generating a reference signal in response thereto, and means, responsive to a control signal, for controlling the measuring device, the improvement comprising:

a set of optical elements;

means for positioning the set of optical elements to postions associated with respective selected ones of the plurality of reference marks;

means for optically sensing the brightness of the set of optical elements and for generating a selection signal in response thereto;

means for generating the control signal in response to the reference signal and the selection signal such that the control signal is generated only when the reference signal is present and the selection signal is simultaneously in a predetermined state;

means for conducting the control signal to the control means;

a scanning unit mounted for relative movement along the scale;

said positioning means comprising means, mounted to the scanning unit, for adjusting individual ones of the optical elements such that each of the optical elements is movable along the direction of the scale into alignment with any selected one of the reference marks.

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## 4,479,717
## APPARATUS FOR MEASURING THE POSITION OF AN OBJECT

Jean Cornillault, Nozay, France, assignor to Compagnie Industrielle des Lasers Cilas Alcatel, Marcoussis, France

Filed Jun. 21, 1982, Ser. No. 390,734
Claims priority, application France, Jun. 23, 1981, 81 12279
Int. Cl.³ G01B 11/00
U.S. Cl. 356—375 5 Claims

1. Measuring apparatus for measuring the position of an object, the apparatus comprising:

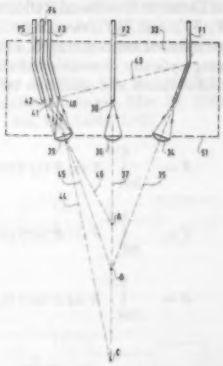
a light generator capable of emitting a beam of light along an emission axis to illuminate the surface of said object;

a photoelectric receiver;

a converging optical measurement system having a reception field that shares a volume of space in common with said emission beam, the optical system being suitable for forming an image of at least a portion of said illuminated surface when the object passes through said common volume, whereby at least some of the light from the emission beam is diffused from the object to said receiver; and

means for processing the electrical signal delivered by said receiver in response to illumination by said diffused light;

wherein said receiver comprises at least two photoelectric measurement detectors having reception surfaces disposed next to one another along a straight line that intersects said emission axis, said measurement detectors receiving light diffused in respective different reception fields in said common volume, said reception fields overlapping partially in such a manner that as the object moves from a minimum distance from the measuring apparatus to a maximum distance therefrom through said common volume, the response of each detector is to give an electrical signal that rises from a minimum value to a peak value and then falls back to the minimum, with the detectors being activated successively and with the peak response of each detector co-inciding substantially with the beginning of the rise in the response of the next successive detector, whereby the object moving in said manner initially occupies a first zone in which it activates a first detector on its own, then a second zone in which it activates both the first detector and and a second detector, and so on until it arrives in a last zone in which activates a last detector on its own, with measurement being performed on the basis of the signal from the detector having a rising slope of response with increasing object distance for the zone in which the object is located, and with no measurement being performed when the object is in the last zone and activates the last detector on its own;



wherein the apparatus further includes a reference photoelectric detector having a reception surface placed close to that of said photoelectric receiver, and a reference optical system for forming an image of the illuminated surface of the object on the reference detector, with the reference detector having a reception field that includes the entire illuminated surface of the object regardless of its position in the common volume, whereby the reference detector delivers an electrical signal proportional to the total light power diffused by the object;

and wherein said electrical signal processing means comprise:

a logic circuit connected to receive the electrical output signals from the measurement detectors to determine from said output signals the zone in which the object is located, and to select the corresponding detector having a rising response with increasing object distance in said detected zone;

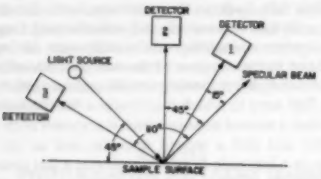
a divider circuit connected to receive the output signal from the selected detector and to receive the output signal from the reference detector, and to deliver an output ratio signal proportional to the ratio between the amplitudes of said signals received thereby; and

a processor circuit capable of determining the distance of the object on the basis of its zone and said ratio signal.

## 4,479,718
## THREE DIRECTION MEASUREMENTS FOR CHARACTERIZATION OF A SURFACE CONTAINING METALLIC PARTICLES

David H. Alman, Royal Oak, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 17, 1982, Ser. No. 389,287
Int. Cl.³ G01J 3/46
U.S. Cl. 356—405 3 Claims




1. An improved method for instrumentally characterizing the optical properties of a paint film containing metallic flakes by using multiangular spectrophotometric measurements to derive color constants for the paint, wherein the improvement comprises using three multiangular measurements utilizing the techniques of Detector Modulated Reflectance, taken at angles of about 15°, 45°, and 110°, as measured from the specular angle with an illumination angle of 45° relative to the metallic paint film being optically characterized and determining X, Y and Z tristimulus values of a paint film by using the following equations:

$$X = \int_{360}^{830} R(\lambda)\, E(\lambda)\, \bar{x}(\lambda)\, d\lambda$$

$$Y = \int_{360}^{830} R(\lambda)\, E(\lambda)\, \bar{y}(\lambda)\, d\lambda$$

$$Z = \int_{360}^{830} R(\lambda)\, E(\lambda)\, \bar{z}(\lambda)\, d\lambda$$

wherein

R is the reflectance factor data,

$\bar{x}$, $\bar{y}$, $\bar{z}$ data on the sensitivity of the human eye,

E is the irradiance of a light source and

λ function of wavelength in the visible light spectrum from 360–830 nanometers.

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## 4,479,719
## DRINK MIXING APPARATUS

David B. McCartney, 4596 Manitou Rd., Excelsior, Minn. 55331

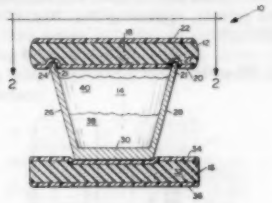
Filed Aug. 26, 1982, Ser. No. 411,683
Int. Cl.³ B01F 15/00
U.S. Cl. 366—130 5 Claims

1. In combination, a circular container cover pad, container, and circular base cover pad comprising:

a. circular container cover including a vinyl closed-cell foam of ¼" thick and 3" diameter, urethane film laminated on both sides thereof, and a single semi-circular groove of two inches projecting inwardly 1/16" to ¼" to said cover for accepting a lip of a container;

b. container including a lip, sides, and structural base supported for accepting and retaining a plurality of liquids; and,

c. circular base pad of a smooth vinyl, closed-cell foam of 6" diameter including urethane film laminated on both sides thereof whereby said cover retains said liquid within said container and said pad provides for upward mixing motion of said liquid contents with like and equal reactionary forces thereby providing for rapid mixing of said liquids.



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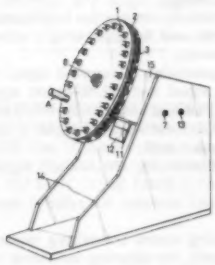
## 4,479,720
## APPARATUS FOR ROTATING REACTION VESSELS IN INCLINED POSTURE

Ei Mochida; Takashi Kudo, both of Tokyo; Toshiyuki Sugawara, Saitama, and Minoru Tsumura, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,251
Claims priority, application Japan, Oct. 8, 1981, 56-160461
Int. Cl.³ B04B 9/10; G01N 31/00
U.S. Cl. 366—214 11 Claims



11. An apparatus for rotating reaction vessels in an inclined posture comprising:

a first plate;

a shaft for rotatably supporting said first plate, said shaft being rotated by a first electric motor via a reduction gear at a predetermined speed;

a plurality of holes provided on an edge portion of the first plate in an equally spaced relationship;

a plurality of reaction vessel holders fitted into the holes, said reaction vessel holders having a first portion located over the first plate so as to hold a reaction vessel, a fitting portion adapted to fit the reaction vessel holder through the hole, and a contact portion is located under the first plate;

a second plate which is rotatably supported by the shaft, one side face of which is provided with a first gear which is adapted to engage with a corresponding second gear provided on the side face of the contact portion of each reaction vessel holder;

a third gear secured to the rear face of the second plate, said second plate being rotated by means of a second motor via a reduction gear, a fourth gear engaging with the third gear and the reduction gear, and the third gear for rotating the reaction vessel holders via the second plate at a predetermined speed; and

a base fixing the shaft in such a manner that the reaction

vessel holders may be inclined at a predetermined angle to a horizontal plane.

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**4,479,721**

## AGITATOR FOR GRAPE MASH FERMENTATION TANKS

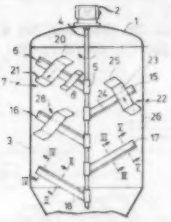
**Herbert Rieger, Talstrasse 33, 7121 Ingersheim, Fed. Rep. of Germany**

**Filed Nov. 13, 1981, Ser. No. 321,328**

**Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043541**

**Int. Cl.³ B01F *7/18***

**U.S. Cl. 366—327** **6 Claims**



1. An agitator for red grape mash comprising in combination:

a vertical rotary shaft with

rods projecting outwardly therefrom for reception in red grape mash having grape cake therein;

stirring wings carried by said rods;

each of said wings having at least one first central section inclined at an angle relative to the sense of rotation for transporting the grape mash and for cutting pieces of the grape cake in an upward or downward direction according to the direction of inclination and the sense of rotation;

each of said wings having also at least one second end section connecting with one end of said first central section to cut the grape cake at the surface of the mash into pieces,

said second section being inclined in the same direction as said first section but at an angle smaller than the angle of inclination of said first section;

and means for slowly rotating said shaft in one direction,

stopping said shaft,

and rotating said shaft in the opposite direction;

two groups of said rods and stirring wings being provided;

said stirring wings of said two groups being oppositely inclined such that during rotation a first group of said stirring wings conveys the grape mash in one axial direction;

while the stirring wings of the second group convey the grape mash in the opposite axial direction,

the rods and stirring wings of the two groups being staggered relative to each other in the direction of rotation of the agitator shaft.

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**4,479,722**

## ELECTRONIC DIGITAL DISPLAY WATCH HAVING SOLAR AND GEOGRAPHICAL FUNCTIONS

**Ibrahim M. Salah, Salzhausstrzusse 7, 2503 Biel, Switzerland**

**Continuation of Ser. No. 271,859, Jun. 9, 1981, abandoned. This application Jun. 16, 1981, Ser. No. 274,264**

**Claims priority, application Switzerland, Jun. 10, 1980, 4453/80**

**Int. Cl.³ G04B *19/26***

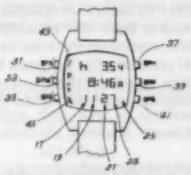
**U.S. Cl. 368—17** **23 Claims**

1. A timepiece comprising:

clock means for keeping standard time and generating first data representative thereof;

input means for inputting second data representative of a longitudinal position and a latitudinal position on the earth, and for inputting third data representative of a standard time different from said standard time represented by said first data;

calculator means responsive to said clock means and said input means for generating fourth data representative of



the position of the sun at the location represented by said second data and at the time represented by at least said third data; and

display means responsive to said calculator means for visually displaying indicia representative of said position of the sun.

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**4,479,723**

## ANALOG ELECTRONIC TIMEPIECE DRIVE CIRCUITRY FOR ENERGIZING STEPPING MOTOR DRIVE COIL IN FULL AND INTERMEDIATE EXCITATION STATES, AND METHOD THEREFOR

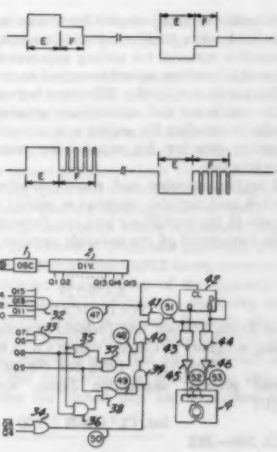
**Masaharu Shida, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan**

**Filed May 22, 1981, Ser. No. 266,213**

**Claims priority, application Japan, May 23, 1980, 55-68450**

**Int. Cl.³ G04F *5/00***

**U.S. Cl. 368—157** **35 Claims**



1. In an electronic timepiece having a stepping motor comprised of a stator, rotor and drive coil; and time-indicating means connected to the stepping motor for indicating time in response to rotation of the rotor: circuit means for periodically energizing the drive coil by periodically applying thereto drive signals so as to rotationally drive the rotor in a stepwise manner in a forward direction of rotation, said circuit means including means operative during each energization period for sequentially energizing the drive coil first in a full excitation state by applying thereto a first drive signal component com-

posed of a pulse of uniform voltage level to apply a given effective power to the drive coil effective to at least initiate driving of the rotor in the forward direction from an initial position through at least a 180° forward angle of rotation to a new position, and then in an intermediate excitation state by applying thereto a second drive signal component to apply effective power less than said given effective power to the drive coil effective to ensure completion of the driving of the rotor through said at least 180° forward angle of rotation by preventing return rotation of the rotor in the reverse direction back to its initial position after the rotor has forwardly rotated through a certain angular extent towards its new position thereby stabilizing the operation of the stepping motor.

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**4,479,724**

## WATER-RESISTING STRUCTURE FOR A WATCH

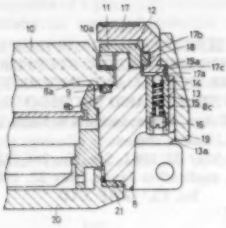
**Masataka Matsumoto, and Toshio Murata, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Aug. 22, 1983, Ser. No. 525,108**

**Claims priority, application Japan, Aug. 24, 1982, 57-126895[U]; Jan. 21, 1983, 58-6903**

**Int. Cl.³ G04B *37/00***

**U.S. Cl. 368—291** **6 Claims**



1. A water-resisting device for a watchcase having a case body, a back and a glass, comprising a sealing member made of compressible material for sealing said watchcase;

a movable member which is moved in the axial direction of the watchcase by the difference between the pressure in the watchcase and atmospheric pressure; and

an elastic member for urging said movable member to said sealing member for maintaining watertightness of the watchcase;

said sealing member and elastic member being such that when said movable member is moved by said difference, gases in the watchcase leak out through a gap formed by the movement of the movable member.

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**4,479,725**

## WATCHCASE

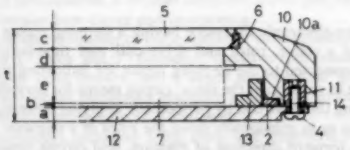
**Hiroshi Koide, Tanashi, and Toshiaki Sawada, Kitakami, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Apr. 8, 1983, Ser. No. 483,379**

**Claims priority, application Japan, Apr. 20, 1982, 57-57467[U]**

**Int. Cl.³ G04B *37/00***

**U.S. Cl. 368—292** **3 Claims**



1. A watchcase comprising a case body having a recessed shoulder at the corner of the axially extending inside wall and the bottom thereof, a back made of hard metal having a longitudinal elasticity modulus larger than 25,000 kg/mm², means for securing said back to the bottom of said case body, a reinforcement member having an ouside wall and secured to the inside wall of said back so that a groove is defined by the outside wall of said recessed shoulder, and an O-ring engaged with said groove.

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**4,479,726**

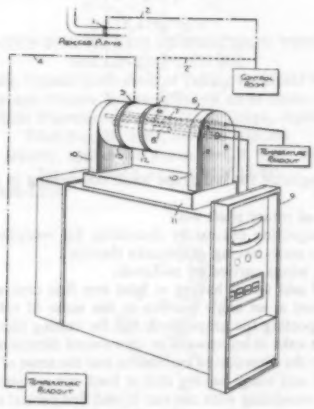
## APPARATUS FOR CALIBRATING SURFACE TEMPERATURE MEASURING DEVICES

**Perry J. Townsend, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Filed Mar. 28, 1983, Ser. No. 479,298**

**Int. Cl.³ G01K *15/00***

**U.S. Cl. 374—1** **2 Claims**



1. Portable apparatus for calibrating thermoelectric surface temperature measuring devices for use with a process control pipe line comprising in combination:

(a.) a cylindrical shaped metal calibrator rod selectively mounted to a heater controller;

(b.) controlled electrical heating means mounted within said rod;

(c.) said heater controller being a proportional output heating controller;

(d.) a standard platinum resistance thermometer probe mounted within said metal rod, said probe being connected to said proportional output heating controller;

(e.) a second standard platinum resistance probe mounted on the surface of said rod, said probe being electrically connected to a standard temperature read-out meter; whereby a temperature sensor with the process control pipe line is calibrated by said portable calibrating apparatus.

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**4,479,727**

## APPARATUS AND METHOD FOR EVALUATING THE PERFORMANCE OF A HEAT EXCHANGER

**Albert A. Domingorena, Liverpool; Donald G. Rich, Fayetteville, and John D. Manning, Liverpool, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Sep. 1, 1982, Ser. No. 413,853**

**Int. Cl.³ G01N *25/00***

**U.S. Cl. 374—45** **11 Claims**

1. A method of measuring the heat transfer performance of a tube in tube heat exchanger having an inner tube defining a

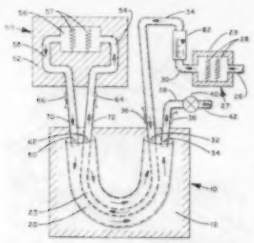
first portion of a flow path and an outer tube defining a second portion of a flow path which comprises the serial steps of:

insulating said heat exchanger from the external environment;

supplying a heat transfer fluid to said inner tube of said heat exchanger at a known flow rate;

passing said heat transfer fluid through said inner tube and out of said heat exchanger;

adding heat energy at a known rate to said heat transfer fluid which has passed through said inner tube at a point external of said heat exchanger;



directing said heated heat transfer fluid into said outer tube of said heat exchanger such that said heat transfer fluid flowing through said inner tube is in heat exchange relationship with said heated heat transfer fluid flowing through said outer tube; and

determining the temperature change of said heat transfer fluid between an inlet and an outlet of one of said inner and outer tubes, said temperature change being indicative of the heat transfer rate between said inner and outer tubes.

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**4,479,728**

## TURBOCHARGER BEARING SYSTEM

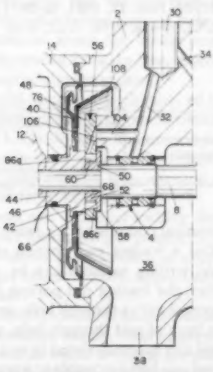
**Steven M. Miller, West Yorkshire, England, assignor to Holset Engineering Company Limited, Turnbridge, England**

**Filed Apr. 22, 1983, Ser. No. 488,502**

**Claims priority, application United Kingdom, Apr. 22, 1982, 8211698**

**Int. Cl.³ F16C *17/04***

**U.S. Cl. 384—369** **10 Claims**



1. A turbo machine thrust bearing system for a rotatable shaft journalled for rotation and having an annular counter thrust surface, said thrust bearing system comprising:

a plate comprising a central aperture through which the shaft extends and having a plurality of tapered lands having a low end and a high end defining bearing sectors disposed in succession in an arcuate array about the aperture, each sector in the radially outer portion thereof adjacent the high end being retrenched along the sector towards the low end of the sector so that along the direction of rotation of the counter thrust surface relative to the sector, the outer portion of the high end terminates before a more radially inner portion of the high end.

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**4,479,729**

## STUFFING CASSETTE WITH EXTERNAL DRIVE

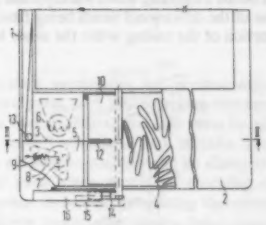
**Otmar Irro, Feldkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jun. 9, 1983, Ser. No. 502,512**

**Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225112**

**Int. Cl.³ B41J *32/02***

**U.S. Cl. 400—196.1** **6 Claims**



5. A stuffing cassette for use in a typewriter or printer having a drive for ribbon contained in the stuffing cassette, comprising:

a stuffing space means comprising a chamber with an open side into which the ribbon is stuffed by the drive of the typewriter or printer;

a flap hingeably connected at the open side of the stuffing space, said flap having a slot positioned to receive the ribbon prior to initial use;

the flap having means cooperable with a member associated with the typewriter or printer such that prior to loading the flap is in a closed position which closes off the open side of the stuffing space and when loaded the flap is in an open position such that the stuffing space is open;

positioning means for the ribbon which cooperates with the flap slot when the ribbon is in the slot such that prior to loading the ribbon is positioned to be freely received and aligned with respect to the drive of the typewriter or printer when the cassette is loaded, the slot being dimensioned such that the ribbon is released from the slot after insertion and when the flap is in an open position; and

the flap being dimensioned such that after removal of the cassette from the typewriter or printer the ribbon is pinched between the closed flap and a portion of the cassette.

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**4,479,730**

## RIBBON CARTRIDGE

**Satoru Yoshioka; Takumi Namekawa, and Iwao Mitsuki, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed May 28, 1982, Ser. No. 383,062**

**Claims priority, application Japan, Jun. 5, 1981, 56-86725; Jun. 24, 1981, 56-93475[U]**

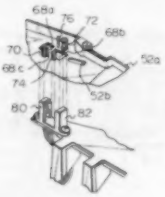
**Int. Cl.³ B41J *32/00, 35/04***

**U.S. Cl. 400—208** **17 Claims**

1. A ribbon cartridge comprising:

a casing formed with a ribbon outlet and a ribbon inlet;

a supply reel;
a supply of ribbon wound on the supply reel;
a take-up reel;
ribbon means provided adjacent to the take-up reel for feeding ribbon along a predetermined path from the supply reel onto the take-up reel;
tension supply means for applying a tension to the ribbon;
guide means located adjacent to the ribbon outlet and the ribbon inlet for guiding the ribbon which spans the ribbon outlet and the ribbon inlet outside the casing;
ribbon end detector mounting means provided in the casing such that the ribbon advancing through the predetermined path between the supply reel and the ribbon outlet traverses the ribbon end detector mounting means;
the tension supply means comprising a resilient clip member which has a generally U-shaped base portion, a pair of legs extending from opposite ends of the base portion beyond the maximum diameter of the ribbon on the supply reel and locally curved toward each other to fit in an annular recess formed in an upper portion of the supply reel, and parallel bends extending downwardly from the respective legs, one of the downward bends being fixed in place by a rigid portion of the casing while the other being held in a




defined position in an elongate opening formed through the casing, said other downward bend urging the ribbon in such a direction that the ribbon is placed under tension, the U-shaped base portion being radially spaced from the upper portion of the supply reel in the opposite direction to the legs;
the ribbon end detector mounting means comprising a detecting opening formed in the casing for receiving a detecting portion of a ribbon end detector; and
second guide means provided adjacent to the opening for guiding the ribbon such that the ribbon is fed across the opening along the predetermined path;
the second guide means comprising a first roller for receiving the ribbon from the supply reel, and a second roller for receiving the ribbon from the first roller to guide the ribbon to the ribbon outlet;
the second guide means further comprising a first guide post opposite to the first roller and a second guide post opposite to the second roller, the ribbon being inserted into a gap between the first guide post and the first roller and a gap between the second guide post and the second roller;
each of the first and second guide posts being formed with an obliquely truncated upper end which faces the corresponding roller.

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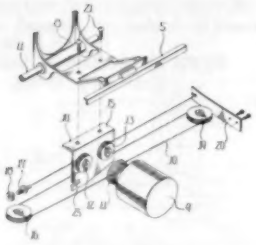
**4,479,731**

## SERIAL PRINTER CARRIAGE MOUNTING

**Katsuhiko Kawaguchi, Tagata, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan**

**Filed Jun. 29, 1983, Ser. No. 508,912**
**Claims priority, application Japan, Jun. 30, 1982, 57-114313**
**Int. Cl.³ B41J *25/28***
**U.S. Cl. 400—320** **5 Claims**

1. A serial printer comprising:
(a) a pair of side plates opposed to each other;
(b) a platen extending between said pair of side plates;
(c) a carrier;
(d) a printing head mounted on said carrier;
(e) first means for slidably mounting said carrier so that said carrier may be reciprocated along said platen;
(f) a wire retainer;
(g) second means for connecting said wire retainer to said carrier, said second means permitting ready detachment of said carrier from said wire retainer;
(h) a motor which can be rotated normally and reversely;
(i) a winding drum driven by said motor;
(j) a wire which is trained over said winding drum and which is connected to said wire retainer such that rotation



of said motor while said carrier is attached to said wire retainer causes corresponding movement of said carrier and of said printing head;
(k) a base member which is fixed relative to said side plates; and
(l) third means for temporarily fixing said wire retainer to said base member while said carrier is detached from said wire retainer for repair or the like, said third means not requiring that said wire be disconnected from said wire retainer while said carrier is detached from said wire retainer.

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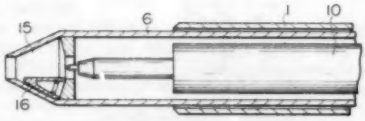
**4,479,732**

## WRITING INSTRUMENT WITH SEALING CAP RETAINED IN TIP

**Kazuo Shimizu, Osaka, Japan, assignor to Ancos Co., Ltd., Osaka, Japan**

**Filed Jul. 2, 1982, Ser. No. 394,987**
**Claims priority, application Japan, Jul. 2, 1981, 56-102238; Sep. 3, 1981, 56-137779; Nov. 11, 1981, 56-167110[U]**
**Int. Cl.³ B43K *9/00, 7/12, 8/02***
**U.S. Cl. 401—107** **23 Claims**



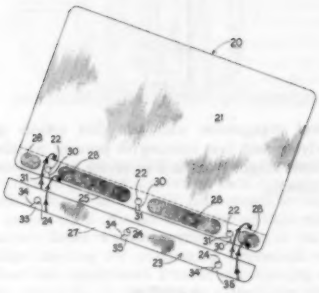

1. A writing instrument comprising; a writing member fitted in a barrel such that a leading end portion of said writing instrument and said writing member can be moved axially relative to each other; the leading end portion of said writing instrument being formed with a through hole, an accommodating chamber at the back of said through hole, a free-standing gravity actuated seal cap accommodated in said accommodating chamber, said seal cap being movable to a position in which it does not block the advance of said writing member relative to the leading end portion of said writing instrument, or to a position behind said through hole in which it is fitted on a writing tip of said writing member while blocking the advance of said writing member relative to the leading end portion of said writing instrument.

4,479,733

## DUAL-FUNCTION LOOSELEAF BINDER SHEETS

Leonard Segal, Lakeville, Conn., assignor to The Dotty Smith Corporation, Lakeville, Conn.

Filed Dec. 27, 1982, Ser. No. 453,579
Int. Cl.³ B42F 3/00
U.S. Cl. 402—79 8 Claims



1. A looseleaf binder sheet for mounting in looseleaf binders incorporating binder means, with each looseleaf binder sheet capable of being securely maintained in locked engagement with the binder means as well as easily removed therefrom when desired without tearing or ripping the sheet and without opening of the binder means, each looseleaf binder sheet comprising:

A. a binder-engaging section incorporating

(1) at least two layers formed therealong each layer having a coinciding free, exposed edge, and

(2) a plurality of binder-receiving holes

(a) positioned along the binder engaging section inwardly spaced from the free, exposed edge thereof in substantial alignment, and

(b) formed through the plurality of layers;

B. a set of cooperating, juxtaposed, overlapping oppositely extending binder-locking fingers each having its terminating end defined by a slit in the binder-engaging section extending between the free, exposed edge thereof and each binder-receiving hole; and

C. each of said sets of binder-locking fingers comprising a single binder-locking finger in each of the layers, and the finger-end-defining slit in each of said layers being non-coincidingly offset from the finger-end-defining slit in the adjacent layer

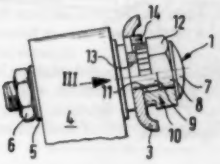
whereby the plurality of sets of binder-locking fingers securely maintain the looseleaf binder sheet engaged with the binder means in response to forces acting in the plane of the looseleaf binder sheet, while allowing the looseleaf binder sheet to be quickly and easily removed from engagement with the binder means in response to forces acting substantially perpendicular to the plane of the looseleaf binder sheet, or at an acute angle thereto, by the flexible, spreading disengagement of the binder-locking fingers in response to said force.

4,479,734

## ADJUSTING MECHANISM FOR POSITION-ADJUSTABLE CONNECTED STRUCTURAL PARTS, ESPECIALLY A DRIVING-BELT TENSION MECHANISM WITH A CLAMPING COVERPLATE

Hubert Rother, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,182
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039215
Int. Cl.³ F16D 1/00
U.S. Cl. 403—4 8 Claims



1. An adjusting mechanism for position-adjustable connected structural parts, such as in a driving-belt tension mechanism, where a first structural part that must be adjusted with respect to a second structural part includes a rack means, pinion means adapted to position and be clamped along with said structural parts screw means for clamping of the parts, said pinion means including an opening therethrough for receiving said screw means, said opening being non-circular and cooperating with a non-circular portion of said screw means to relate said pinion means to said screw means.

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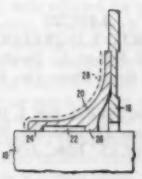
4,479,735

## SHRINK FIT SLEEVE FOR ROTATING MACHINERY

Daniel G. Thompson, Pittsburgh, and Siu-Kee Chan, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1983, Ser. No. 457,787
Int. Cl.³ F16C 1/20
U.S. Cl. 403—28 7 Claims



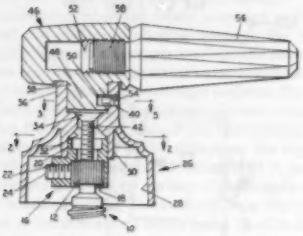
1. For large apparatus including a radial outer rotatable element driven by and encompassing a rotating shaft, and adapted for operation in an environment subject to severe cyclic loading occasioned by large speed changes and/or large thermal transients, an improvement for reducing ratcheting of the driven element relative to said shaft, comprising:

an intermediate sleeve element between said outer driven element and said shaft, said outer driven element being heat shrunk on said sleeve, said sleeve having a greater flexibility in at least an axial direction than in a radial direction.

## 4,479,736
## REPLACEABLE HANDLE ASSEMBLY

**Frank C. Evans, Rockford, and Merritt J. Nelson, Sparta, both of Mich., assignors to Zin-Plas Corporation, Grand Rapids, Mich.**

**Filed Dec. 12, 1983, Ser. No. 560,738**
**Int. Cl.³ B25G *3/00*; F16D *1/00***
**U.S. Cl. 403—287** **20 Claims**



1. A replaceable handle assembly for coupling a handle to a valve stem with a spline portion comprising:

a connector with means for nonrotatably interlocking the spline portion of the valve stem and having a noncircular base-engaging portion;

a base member positioned on said connector and having a depending skirt to cover said connector and a portion of the valve stem, and connector engagement means complementary to the noncircular base-engaging portion of the connector for nonrotational coupling between said connector and said base member, and noncircular post-engaging means formed in an upper portion of said base member;

means for selectively securing said base member to said valve stem to prevent upward movement of said base member and connector with respect to said valve stem;

a handle-bearing post having a depending noncircular base-engaging portion complementarily shaped to nonrotatably engage said base member post-engaging means; and

means at least partially concealed beneath said handle and carried by said base member for selectively restraining upward movement of said post with respect to said base member;

whereby said handle is selectively nonrotatably secured to a valve stem through a simple securing means but with said securing means substantially hidden from view.

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## 4,479,737
## POSITIVE INTERLOCK

**George G. Bergh, and Robert G. Bergh, both of Plainville, Mass., assignors to Bergh Bros. Co., Inc., Attleboro Falls, Mass.**

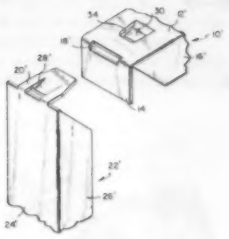
**Continuation of Ser. No. 344,822, Feb. 1, 1982, abandoned. This application Sep. 21, 1983, Ser. No. 534,330**
**Int. Cl.³ E04C *2/38***
**U.S. Cl. 403—382** **3 Claims**

1. Apparatus for mechanically interlocking the ends of two mutually perpendicular wall sections, comprising:

first and second tongues and first and second openings on one of said wall sections, said first tongue being perpendicular to and extending inwardly from the end of said one wall section, said first opening lying at the juncture of said first tongue and said one wall section, said second tongue pointing towards said first tongue at a location underlying said second opening, said second tongue cooperating with said one wall section to define a receiving notch opening towards said first opening,

a third tongue perpendicular to and extending inwardly from the other of said wall sections, said third tongue being dimensioned to pass through said first opening into said receiving notch, and

a resiliently depressible detent on said third tongue facing towards said other wall section arranged to coact in mechanical engagement with said first tongue generally underlying said first opening to prevent withdrawal of said third tongue from said receiving notch through said first opening.



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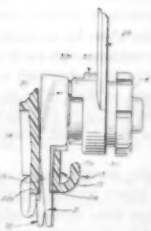
## 4,479,738
## ATTACHING ASSEMBLY

**Norman R. Kubnick, Skokie, Ill., assignor to Sellstrom Manufacturing Company, Palatine, Ill.**

**Filed Apr. 27, 1983, Ser. No. 489,048**
**Int. Cl.³ B25G *3/00***
**U.S. Cl. 403—407** **3 Claims**



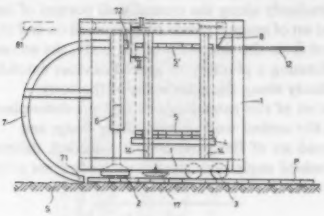
1. An assembly for use in attaching a secondary unit to a primary unit wherein the latter is provided with an exterior wall surface, and a shoulder projecting outwardly from the wall surface and provided with an upwardly extending passageway; said assembly comprising at least one removable bracket having a base portion adapted to rest upon and be supported by the shoulder, and a plurality of fingers connected to and depending from said base portion for insertion into a resilient engagement with the shoulder passageway and effect retention of said bracket in assembled relation with the primary unit; and adjustable means coacting with said bracket base portion for connecting the secondary unit thereto; said base portion having a surface thereof adjacent the exterior wall surface of the primary unit provided with a recess portion having an opening formed therein through which extends a portion of a first fastening component and terminates outwardly of said base portion; a second fastening component is manually adjustable on the outwardly extending portion of said first fastening component, said fastening components coacting with one another for frictionally sandwiching a segment of the secondary unit between an exposed surface of said base portion and said second fastening component.

4,479,739

## MACHINE FOR LAYING SHAPED BRICKS

Otfried W. Schweikert, Mühlbachstrasse 13, D-8575 Kirchthumbach, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,335
Int. Cl.³ E01C *19/52*
U.S. Cl. 404—99 9 Claims



1. Apparatus for laying road stones on a relatively soft subgrade surface to produce a paved surface, comprising a movable machine frame having a lift table means for supporting a layered supply stack of road stones for vertical movement in said machine frame, a transfer chute means in the form of a simicircular housing for conducting uppermost road stone layers from said supply stack from an inlet opening end to said subgrade surface for laying through a discharge opening end, said transfer chute means positioned at the forward end of said machine frame in the direction of paving such that subsequently laid stones are gravitationally pressed against previously-laid stones, an insertion means mounted on said machine frame for intermittently feeding each said uppermost road stone layer from said supply stack into said transfer chute means inlet opening end, and means for supporting said machine frame for movement in the paving direction comprising wheel members secured to said machine frame and riding directly on said surface being laid.

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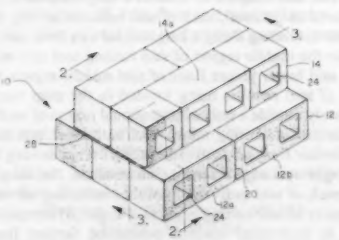
4,479,740

## EROSION CONTROL DEVICE AND METHOD OF MAKING AND INSTALLING SAME

Cecil F. Schaaf, Standish, and Russell J. McIntosh, Flushing, both of Mich., assignors to Paul A. Kakuris, Chicago, Ill.

Continuation of Ser. No. 68,347, Aug. 21, 1979, abandoned, which is a continuation of Ser. No. 906,105, May 15, 1978, abandoned, and Ser. No. 770,801, Feb. 22, 1977, abandoned. This application May 6, 1982, Ser. No. 375,555
Int. Cl.³ E02B *3/04*
U.S. Cl. 405—30 8 Claims



1. A method of protecting a shoreline from erosion comprising the following steps:

providing a plurality of integral concrete modules, each module having a front face, a rear face, and a bottom face, each module being pyramidal between its front and rear faces and having a size, shape, and weight to be stable, each module defining a plurality of aligned, undivided flow passages extending completely through the module from the front face to the rear face, at least one of said flow passages having a length at least twice as long as its height; then

placing the plurality of modules in the water such that the modules are oriented in an array, each of said modules resting on its bottom face and, when emplaced, having no means of attachment to the underlying ground, other than the force of gravity acting on the module;

each module being located offshore in the water;

each module being oriented such that at least some of its flow passages are inclined with respect to the surface of the water to present a negative angle of attack with respect to incoming waves;

said array of modules effective to cause accretion of water borne material around the modules to protect the shoreline against erosion;

said array of modules free of rigid interconnections therebetween to allow differential settling and movement between adjacent modules in order to allow the array of modules to conform to the changing ground contour.

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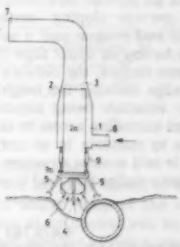
4,479,741

## DEVICE FOR LAYING UNDERGROUND OR DIGGING UP SUBSEA CONDUITS

Alfredo Berti, Fano, and Attilio Ilari, Bologna, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Apr. 26, 1982, Ser. No. 371,730
Claims priority, application Italy, May 4, 1981, 21494 A/81
Int. Cl.³ F16L *1/04;* E02F *3/88*
U.S. Cl. 405—163 9 Claims



1. A device for burying a conduit on a seabed of incoherent material and for digging up a conduit buried in a seabed of incoherent material, the device comprising:

a pair of scooping units adapted for positioning on opposite sides of the conduit, wherein each unit includes a venturi tube having an intermediate portion of restricted cross section, a slurry tube within said venturi tube having an upper end at said restricted cross section of said venturi tube adapted to be positioned on one side of the conduit and adjacent the seabed, wherein said lower end is beveled in the direction of advancing movement of the device along the seabed to facilitate removal of slurry;

a manifold slidably mounted about the lower end of said slurry tube having nozzles depending therefrom about said beveled lower end of and at an acute angle to said slurry tube, and telescoping means connected to said manifold for vertically moving said nozzles relative to said slurry tube and the seabed, to thereby control disaggregation;

means connected to said manifold and nozzles for feeding water under pressure therethrough whereupon the jets of water from said nozzles disaggregate the seabed and form a slurry;

means connected to each of said venturi tubes for feeding water under pressure therethrough wherein a negative pressure is created which causes the slurry to be with-

drawn from the seabed into and through said venturi tubes; and

guiding means for positioning the device on the conduit as it moves therealong for digging up and burying the conduit.

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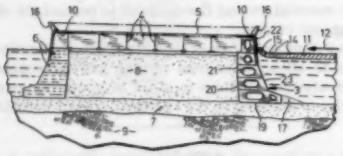
**4,479,742**

## MOBILE BOTTOM-FOUNDED CAISSON FOR ARCTIC OPERATIONS

**John C. Bruce, North Vancouver, Canada, assignor to Gulf Canada Limited, Toronto, Canada**

**Filed Feb. 3, 1982, Ser. No. 345,439**
**Int. Cl.³ E02D** *21/00, 23/02, 31/00*
**U.S. Cl. 405—217** **19 Claims**



1. A floatable caisson capable of being maintained in a fixed position in an ice-covered body of water, comprising:

(a) a perimetrical wall, having an upper portion of sufficient height and disposed at a sufficient angle to the normal surface of said body of water to aid upward fracturing of said ice cover,

(b) an inner wall and a bottom defining with said perimetrical wall an annular structure, said inner wall having a lower portion sloping outwardly and downwardly towards said bottom and a substantially vertical upper portion having an upper edge at least as high as said normal water surface, the distance from said bottom to said upper edge defining the height of said inner wall, said annular structure being capable of supporting a deck structure extending across its central opening, and

(c) means to maintain in an unfrozen state liquid ballast placed in said annular structure and fill material placed in the volume defined by said inner wall.

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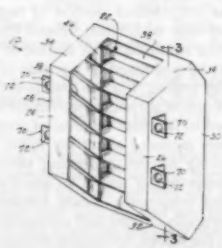
**4,479,743**

## WEAR RESISTANT INSERT FOR PARTICULATE MATERIAL FLOW DUCTS

**Ronald F. Stahl, 9082 Big Hand, Richmond, Mich. 48092**

**Filed Jun. 15, 1983, Ser. No. 504,538**
**Int. Cl.³ B65G** *53/52*
**U.S. Cl. 406—193** **3 Claims**



1. A wear resistant insert for particulate material flow ducts comprising:

a body mounted within a duct, having a central wall portion and a spaced side wall integral with the central wall portion and extending outward therefrom to form a recess within the body; and

means mounted on the body, for forming a plurality of cavities in the body adapted to collect particulate material flowing across the body, wherein the means comprises:

a plurality of spaced, planar ribs mounted on the side walls and the central portion of the body to form successively spaced cavities within the interior of the body;

a first set of spaced planar ribs mounted on and extending upward from the central wall portion of the body; the first set of ribs forming a plurality of spaced cavities extending longitudinaly along the central wall portion of the body;

a second set of spaced, planar ribs mounted on and extending inward from the side walls of the body, the second set of ribs forming a plurality of spaced cavities extending longitudinaly along the sides walls of the body;

the first set of ribs extending at a first pre-determined angle from the central wall portion of the body; and

the second set of ribs extending at a second, different predetermined angle with respect to the first set of ribs.

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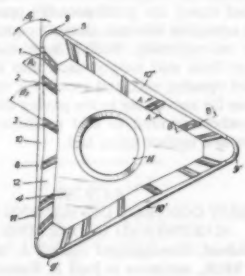
**4,479,744**

## CUTTING TOOL

**Rudolf Stricker, Lermoos, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.**

**Filed Sep. 2, 1982, Ser. No. 413,983**
**Claims priority, application Austria, Sep. 9, 1981, 3888/81**
**Int. Cl.³ B23P** *15/28;* **B26D** *1/00, 3/00*
**U.S. Cl. 407—114** **12 Claims**



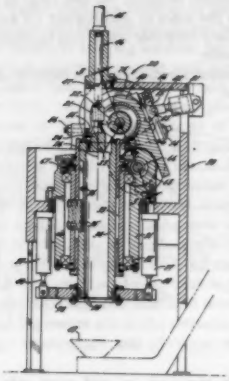
1. A cutting tool having a cutting edge, a curved cutting corner; a chip runoff area adjoining said cutting edge and a middle region having a lower planar floor, said chip runoff area being comprised of at least two hollows beginning near said cutting edge and leading into a middle region of said cutting tool and adapted to deform a chip transversely to the direction of chip runoff, each of said hollows having the form of a notch extending along a longitudinal axis from said cutting edge into the middle region of said cutting tool and extending toward said lower planar floor of said middle region, the first of each of said notches being located in the chip runoff area immediately outside a curved transitional region of said curved corner and said cutting edge, said individual notches positioned farther from said curved cutting corner having increasingly larger spacings between one another, the longitudinal axis of each of said individual notches enclosing an angle ($\beta$) with respect to said cutting edge, said angle ($\beta$) increasing with respect to individual notches positioned farther from said curved cutting corner, each of said individual notches having two opposite sides of different vertical slope with respect to a horizontal plane, the side of each of said notches positioned nearer each curved cutting corner sloping at an angle ($\alpha_1$) with respect to said horizontal plane, the side of said notch positioned farther from said curved cutting corner sloping at an angle ($\alpha_2$) with respect to said horizontal plane, said ($\alpha_1$) being greater than ($\alpha_2$) for each individual notch.

4,479,745

## HOBBING MACHINE

Stuart J. Johnson, and George E. Fransson, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 6, 1982, Ser. No. 375,578
Int. Cl.³ B23F 5/22
U.S. Cl. 409—12 18 Claims



1. A hobbing machine comprising first and second drive shafts, a drive mechanism for rotating said first shaft, first and second coacting gears connected to said first and second shaft, respectively, for transmitting rotation of said first shaft to said second shaft, a rotatable work spindle adapted to carry a work blank for a spur or helical gear, a rotatable hob spindle adapted to carry a hob and extending transversely of said work spindle, said hob spindle being inclined relative to said work spindle at a predetermined setting angle which is other than a right angle, one of said shafts being a hob drive shaft and being connected to rotate said hob spindle, said hob drive shaft being axially alined with said hob spindle and being inclined relative to said work spindle at the same angle as said setting angle, a third gear connected to said work spindle, said third gear being a bevel gear, a fourth gear connected to the other of said shafts and coacting with said third gear to rotate said work spindle whereby said other shaft constitutes a work drive shaft, said fourth gear also being a bevel gear and having an axis which is inclined relative to the axis of said third gear at the same angle as said setting angle, and means mounting said hob spindle for selective pivoting toward and away from said work spindle without changing said setting angle, said hob drive shaft swinging about the axis of said work drive shaft during said pivoting with one of said first and second gears walking around the other of said first and second gears to permit such swinging.

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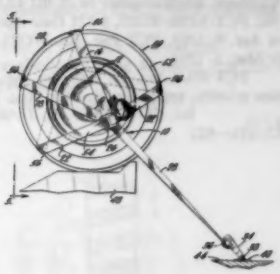
4,479,746

## METHOD AND APPARATUS FOR SECURING A WHEELED VEHICLE

John R. Huber, Holicong, Pa., assignor to TransTechnology Corporation, Sherman Oaks, Calif.

Filed Sep. 28, 1981, Ser. No. 305,962
Int. Cl.³ B60P 7/08
U.S. Cl. 410—21 12 Claims

5. An apparatus for securing a tire equipped wheel of a vehicle to a supporting surface, said apparatus including a harness adapted for placement over the vehicle wheel, said harness comprising a plurality of flexible tension members which upon placement over a vehicle wheel engage only the tire of said wheel, said harness including adjustable tensioning means for securing the harness to the tire of the wheel, said harness further including an extending tension member, and attachment means for adjustably attaching said extending tension member to the supporting surface to prevent movement of the wheel with respect to the supporting surface.



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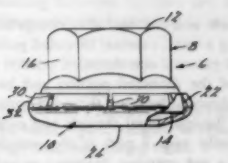
4,479,747

## PRELOADED LOCKNUT

Paul V. Pagel, Ontario, Calif., assignor to Microdot Inc., Darien, Conn.

Filed Apr. 21, 1983, Ser. No. 487,850
Int. Cl.³ F16B 19/00
U.S. Cl. 411—8 1 Claim



1. A fastener assembly comprising

an internally threaded nut having a thread of substantially uniform pitch with a wedge ramp at the root thereof diverging with respect to its central axis in a direction toward one end thereof, said nut having a truncated conical external portion divergent toward and located at the other end thereof,

an externally threaded element having a standard thread sized so as to be receivable in said internally threaded element, the thread of said externally threaded element having a crest that exhibits an interference fit with the wedge ramp on the thread of said internally threaded element when said assembly is under load, and

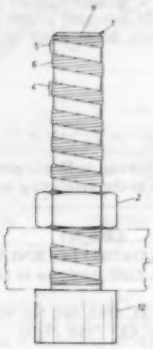
a preload washer permanently assembled with said nut and having a dished section normally spaced from the other end of said nut and a radially outer periphery engaged at all times with the other end of said nut, said washer having a conical flange at the outer periphery thereof extending axially and radially inwardly generally parallel to the conical portion of said nut and engageable therewith to maintain said nut and washer in the assembled condition, deflection of the dished section of said washer maintaining a bias on said nut relative to said externally threaded element in a direction toward said one end thereof whereby the crest of the threads on said element are maintained in engagement with the wedge ramp on said internal thread, the flanged portion of said washer having a plurality of longitudinally extending slots therein, the opposed side walls of said slots being disposed in convergent relation when said assembly is unloaded and parallel relation when said assembly is fully loaded so as to give visual indication of said loaded condition.

4,479,748

## SCREW-AND-NUT UNIT OR SCREW JOINT

Jack Uhlmann, Köpmansgatan 14, S-302 42 Halmstad, Sweden

PCT No. PCT/SE80/00203, § 371 Date Apr. 9, 1981, § 102(e) Date Apr. 9, 1981, PCT Pub. No. WO81/00603, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 12, 1980, Ser. No. 253,530
Claims priority, application Sweden, Aug. 14, 1979, 7906770
Int. Cl.³ F16B 33/02, 37/08
U.S. Cl. 411—412 1 Claim



1. A screw and nut assembly comprising a screw spindle body having a spiral external threaded portion along its length and a spiral external non-threaded portion separating the convolutions of the threaded portion and having a plurality of individual threads, the spiral threaded portion having a greater pitch than the individual threads and each individual thread extending only over a part of the periphery of the spindle body, and a nut member having a spiral internal threaded portion which matches the spiral non-threaded portion of the spindle body and spiral internal non-threaded portion, the internal threaded portion having a plurality of individual threads which match the individual threads on the spindle body, the arrangement being such that when the nut threads and the spindle threads are not in engagement the nut threads are positioned in the non-threaded spindle portion and the spindle threads are positioned in the non-threaded nut portion whereby the nut member can be rapidly moved along the spindle body by rotation of the nut member relative to the spindle body and whereby the nut member may thereafter be turned to engage its threads with the spindle threads.

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4,479,749

## ROTARY CAR DUMPER INSTALLATION WITH INTEGRAL DUST COLLECTION

Willard Binzen, Medina, Ohio, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed May 27, 1982, Ser. No. 382,780
Int. Cl.³ B65G 67/50
U.S. Cl. 414—291 9 Claims

1. Rotary car dumper apparatus comprising:

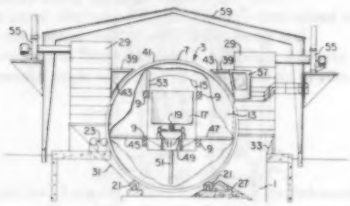
a rotatable frame comprising a pair of vertically oriented, horizontally spaced end rings connected by elongated members to form an open sided cylindrical frame with a horizontal longitudinal axis and having a section of railroad track extending through the frame parallel to said longitudinal axis, said frame including end plates at said end rings enclosing the ends of said cylindrical frame except for an opening through which a railroad car can pass through said frame on said section of track;

a hopper pit under said cylindrical frame for receiving bulk material carried by said railroad car, a portion of said cylindrical frame below said section of railroad track extending downward into said hopper pit;

means for mounting said cylindrical frame through said end rings for rotation about said longitudinal axis to dump bulk material over one side of said railroad car into said hopper pit;

fixed position enclosure means extending along each side of said rotatable frame between the end rings to enclose the space between the sides of said hopper pit and the cylindrical sides of said rotatable frame and to enclose the open sides of the frame;

dust collection means for sucking dust ladened air from said hopper pit; and



planar air shields mounted on said open sided rotatable frame and extending between said end rings parallel to the longitudinal axis of said frame, said planar air shields being arranged to form with the enclosure means as said cylindrical frame is rotated to dump the contents of said railroad car into the hopper pit, a rotatable valve which forms restricted openings above the hopper pit and the railroad car as it is rotated beyond the point where the contents begin to dump, such that ambient air is sucked through these openings by the dust collection means at a velocity which exceeds the velocity required to capture a dust cloud created in the hopper pit and below the railroad car by dumping of the railroad car contents.

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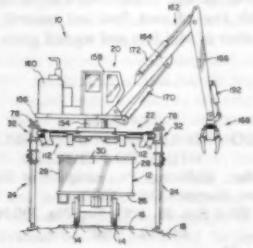
4,479,750

## APPARATUS FOR LOADING AND UNLOADING RAILWAY CARS

Ted C. Johnson, Jr., 33829 Country View La., Chagrin Valley Estates, Solon, Ohio 44139

Continuation-in-part of Ser. No. 124,838, Feb. 26, 1980, abandoned. This application May 20, 1982, Ser. No. 380,034
Int. Cl.³ B65G 67/02; B60S 9/02; B66F 7/26
U.S. Cl. 414—392 21 Claims



1. Article loading and unloading apparatus for use with a railway car on ground supported railway means, said car having laterally opposite side wall means, said apparatus including horizontal platform means, said platform means having opposite sides corresponding to said opposite side wall means of said railway car, crane means on said platform means, leg means

spaced apart in the direction between said opposite sides of said platform means and having vertical positions relative to said platform means, said leg means including leg member means and leg member support means, means mounting said leg member support means on said platform means, said leg member support means in said vertical positions of said leg means supporting said leg member means for displacement between raised and lowered positions relative to said platform means, means to displace said leg member means between said raised and lowered positions, said leg member means in the lowered positions thereof engaging ground and supporting said platform means above said railway car for said car to be movable along said railway means beneath said platform means, said platform means in the raised positions of said leg member means being supported on said side wall means of said railway car, said mounting means including means supporting said leg means for horizontal displacement between laterally extended and retracted positions relative to the corresponding side of said platform means when said leg means are in said vertical positions and said leg member means are in the raised positions thereof, and means to displace said leg means between said extended and retracted positions, said leg means including means engaging said opposite side wall means of said railway car when said leg means are in the retracted positions thereof to clampingly interengage said platform means and railway car.

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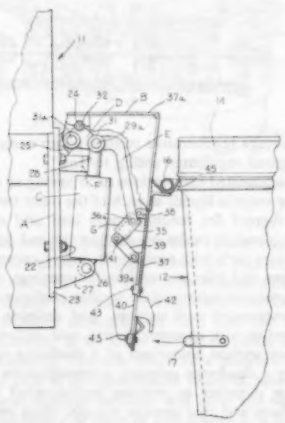
4,479,751

## RECEPTACLE DUMPING APPARATUS

James H. Wyman, Easley, and Robert E. Wyman, Mauldin, both of S.C., assignors to T C I Products, Inc., Easley, S.C.

Filed Dec. 18, 1981, Ser. No. 332,149
Int. Cl.³ B65F 3/02
U.S. Cl. 414—406 10 Claims



6. Receptable dumping aparatus attachable to a refuse truck and the like comprising:
- an upright mounting support attachable to said truck;
- a carriage for carrying a receptacle for dumping into said truck pivotally carried by said support;
- a cylinder carried by said support having extensible means;
- linkage means connected to said extensible means for raising said carriage and the receptacle carried thereby responsive to movement of said extensible means;
- a latch slidable on said carriage for securing said receptacle upon said carriage responsive to said linkage means; and
- a lost motion coupling connecting said linkage means to said latch and for raising said carriage for dumping.

4,479,752

## MOTOR VEHICLE ADAPTED FOR DISABLED DRIVER

Robert E. Todd, 7 Rosamund Pl., Blyth, Northumberland, England

Filed Dec. 1, 1982, Ser. No. 445,992
Claims priority, application United Kingdom, Dec. 10, 1981, 8137268; Jan. 22, 1982, 8201840
Int. Cl.³ B60R 9/00
U.S. Cl. 414—462 15 Claims

1. A motor vehicle comprising
- a seat movable from a normal position within the vehicle to a displaced position projecting laterally outwardly of the vehicle,
- a lifting member on the inside of the door for raising a folded wheel-chair from the ground into a storage position against the inside of the door, and
- retaining means reacting between the door and the wheel-chair and operable to retain said wheel-chair in the storage position.

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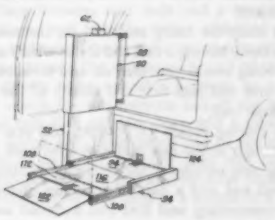
4,479,753

## WHEELCHAIR LIFT FOR PASSENGER VEHICLES

Graham R. Thorley, La Mesa, Calif., assignor to Transportation Design & Technology, Inc., San Diego, Calif.

Filed May 19, 1982, Ser. No. 379,526
Int. Cl.³ B60P 1/44
U.S. Cl. 414—541 8 Claims



3. A lift mechanism operable between a compact mode and a deployed mode comprising:
- a platform;
- a vertical carrier a lower portion of which defines a horizontal axis hinge with one edge of said platform;
- means vertically movably mounting said carrier;
- means for pivoting said platform on said hinge from a generally horizontally extended mode to a vertical mode;
- means for selectably elevating and lowering said vertical carrier between an upper level and a lower level, whereby said platform can be deployed horizontally for use and raised and lowered on said vertical carrier to move an object or a person between said upper and lower level or alternatively swung upwardly on said hinge into a compact position for stowage;
- wherein said vertical carrier telescopes inside a horizontal carrier, and said platform, horizontal carrier and vertical carrier are of substantially the same platform dimensions

and overlap one another to define a compact package in said compact mode when said platform is in its vertical position and said vertical carrier is raised inside said horizontal carrier; and

including a mounting plate horizontally slidably mounting said horizontal carrier and said plate is pivoted in a doorway on a vertical axis to permit swinging said lift mechanism from said compact mode to a stowed mode inside said doorway.

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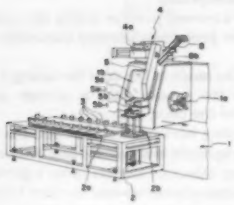
**4,479,754**

## INDUSTRIAL ROBOT

**Hajimu Inaba, Hino, and Shigemi Inagaki, Kokubunji, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Jul. 2, 1982, Ser. No. 394,773**
**Claims priority, application Japan, Jul. 4, 1981, 56-104775**
**Int. Cl.³ B23Q *7/04***
**U.S. Cl. 414—728** **4 Claims**



1. An industrial robot mounted on a machine tool for servicing said machine tool, comprising:

a spindle on the machine tool;

an arm having first and second ends and equipped at the first end thereof with a wrist and gripping means for gripping an object;

a main body for being mounted on the machine tool, the main body having a first rod about which said arm rotates;

first driving means provided on said main body for moving said arm and said first rod axially of the spindle on the machine tool;

second driving means for rotating said arm in a plane perpendicular to the axis of the spindle, with the second end of the arm serving as the center of rotation; and

a second rod and a pair of spanning plates spanning and interconnecting said first rod and said second rod, said pair of spanning plates being moved by said first driving means.

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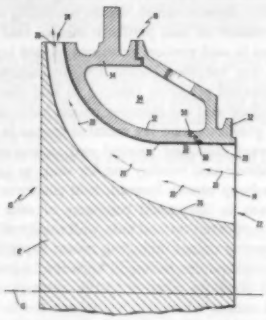
**4,479,755**

## COMPRESSOR BOUNDARY LAYER BLEEDING SYSTEM

**Ivar H. Skoe, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway**

**Filed Apr. 22, 1982, Ser. No. 370,919**
**Int. Cl.³ F04D *17/10, 29/68***
**U.S. Cl. 415—1** **18 Claims**

1. Improved method for controlling the fluid boundary layer in a compressor having a plurality of blades rotating in a housing, the method including the step of continuously extracting fluid from the region of the housing wall through at least one bleed passage formed in the housing wall to a fluid collector, the bleed passage having an inlet and an outlet, the improvement in the extracting step comprising the step of periodically lowering the static pressure at the bleed passage inlet to coincide with the arrival of the suction sides of the compressor



blades, for increasing the amount of fluid extracted from the suction sides for a given collector static pressure.

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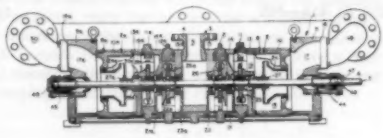
**4,479,756**

## MULTI-STAGE PUMP

**Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.**

**Continuation of Ser. No. 155,779, Jun. 2, 1980, abandoned, which is a continuation of Ser. No. 935,604, Aug. 21, 1978, abandoned. This application Jan. 17, 1983, Ser. No. 458,662**
**Int. Cl.³ F04D *11/00***
**U.S. Cl. 415—53 T** **10 Claims**



1. A multi-stage regenerative turbine pump comprising:

a. an elongated segmented casing having

(1) two segmented end sections each having an inlet opening for volatile liquids at each of the outer two opposite ends thereof for feeding liquid into said casing end sections and an outlet opening on the end opposite the outer two ends with passageway means communicating between said inlet and said outlet openings, and

(2) a segmented intermediate section positioned between said segmented end sections, and defining an unobstructed interior chamber therein, said segmented intermediate section comprised of a discharge casing ring having a discharge opening communication with said interior chamber to provide unobstructed fluid flow therefrom and two annular transfer rings each having an opening on each side of said discharge casing ring aligned with said outlet openings on each of said end sections for communicating between said outlet openings on each of said end sections and said discharge opening, with said discharge opening of said discharge casing ring disposed substantially midway between said inlet openings for discharging the volatile liquid from said casing,

b. an elongated drive shaft

(1) extending through said elongated segmented casings in substantially longitudinal alignment therewith, and

(2) rotatably mounted in said segmented casing, and

c. an impeller means mounted on and operatively connected to said drive shaft adjacent each of said inlet openings in said end sections for rotation thereby in a plane parallel to

the plane of the discharge opening in said intermediate section, upon rotation of said shaft in said casing, for feeding such volatile liquid into each of said end section casings through said inlet openings, and

d. an equal number of at least one turbine impeller being disposed in each of said end sections in said segmented casing between said intermediate section and each of said inlet openings for pumping the volatile liquid through said passageway means and said openings in said intermediate section and into said interior chamber therein for discharging the volatile liquid from said casing through said discharge opening.

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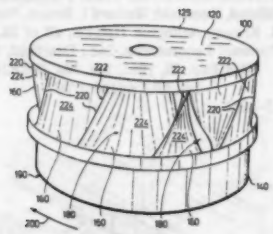
**4,479,757**

## BLADE CONFIGURATIONS FOR FRANCIS-TYPE TURBINE RUNNERS

**David G. Holmes, Schenectady, N.Y.; Richard A. Novak, Boston, Mass., and Jacques Y. McNabb, Beaconsfield, Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada**

**Filed Sep. 30, 1982, Ser. No. 431,255**
**Int. Cl.³ F01D 5/04**
**U.S. Cl. 416—186 R** **3 Claims**



1. A Francis-type hydraulic turbine runner rotatable about an axis of rotation and having a crown forming the upper axial end thereof when said axis of rotation is substantially vertical, a band concentric with said crown on said axis of rotation and an array of blades between said band and said crown, said runner terminating at its lower end in an outlet end, each of said blades having a suction face and a pressure face trailing said suction face in the direction of rotation, said suction and pressure faces meeting between said band and said crown at the outer periphery of each of said blades in a flow dividing edge, said faces providing substantially smooth streamlined surfaces to define flow paths between adjacent of said blades in said array, each of said flow dividing edges meeting with and terminating at said band adjacent an upper edge of said band at a junction, a first portion of said suction surface of each blade located immediately adjacent to said junction and said flow dividing edge being exposed when viewed in an axial direction looking toward said outlet end so that said first portion of said suction face extending from said band toward said crown is sloped rearwardly in the direction of rotation of said runner, a second portion of each of said suction surfaces located spaced from said first portion, said second portions being exposed when viewed in an axial direction looking from said outlet and being located below said junctions.

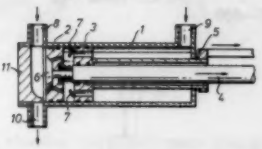


**4,479,758**

## PISTON FILLER

**Albert C. Hersom, Beaconsfield, and Kenneth W. Wright, Twyford, both of England, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland**

**Continuation-in-part of Ser. No. 100,823, Dec. 6, 1979, abandoned, and a continuation-in-part of Ser. No. 236,173, Feb. 20, 1981, Pat. No. 4,411,601. This application Nov. 25, 1981, Ser. No. 324,792**
**The portion of the term of this patent subsequent to Oct. 25, 1990, has been disclaimed.**
**Int. Cl.³ F04B 15/02, 21/02**
**U.S. Cl. 417—388** **13 Claims**



1. A piston filler comprising:

(a) means defining a first cylinder bore having a forward end and a rearward end;

(b) means defining a cutoff bore having an upstream end, a downstream end, an outlet adjacent said downstream end and an inlet remote from said outlet, the forward end of said first cylinder bore intersecting said cutoff bore between said inlet and said outlet;

(c) a first piston having a forward face and a rearward face, such piston being slidably sealingly mounted in said cylinder bore with the forward face of such piston facing toward the forward end of such bore, such piston being slidable between a forward position adjacent said cutoff bore and a rearward position remote from said cutoff bore;

(d) a shuttle having a downstream end, an upstream end, a wiping surface between said ends and a recess in said wiping surface, said shuttle being slidably sealingly mounted in said cutoff bore, the downstream end of the shuttle facing toward the downstream end of the cutoff bore, said shuttle being movable between an upstream position in which the downstream end of the shuttle is upstream of said first cylinder bore and a downstream position in which the downstream end of the shuttle is downstream of said first cylinder bore and the recess extends between said inlet and said cylinder bore;

(e) means for connecting said inlet to a source of a primary fluid;

(f) cyclically operative reciprocation means for:

(1) retracting said first piston rearwardly while retaining said shuttle in said downstream position, whereby the primary fluid will enter said cylinder bore via said inlet and the recess in the shuttle; then

(2) moving said shuttle to said upstream position; then

(3) advancing said piston to said forward position while retaining said shuttle in said upstream position to expel the primary fluid from the cylinder bore into the cutoff bore downstream of the shuttle; and

(4) moving said shuttle from said upstream position to said downstream position while retaining said piston in said forward position, whereby the shuttle expels primary fluid from the cutoff bore through the outlet and the wiping surface of the shuttle engages and wipes the forward face of the first piston;

(g) cutoff bore wash means for supplying a secondary fluid to said cutoff bore upstream of said

(h) cylinder bore wash means for passing said secondary fluid into and out of said first cylinder bore rearwardly of said first piston; and

(i) outlet wash means for introducing said secondary fluid into said cutoff bore downstream of said shuttle while said shuttle is adjacent said downstream position so that such fluid contacts the downstream end of the shuttle to thereby wash any residual primary fluid from the downstream portion of said cutoff bore and the downstream end of the shuttle.

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**4,479,759**

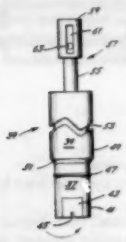
**VALVELESS, POSITIVE DISPLACEMENT PUMP**

**Vernon Zeitz, 4 Plain Hill Rd., Springfield, Vt. 05156**

**Continuation of Ser. No. 103,036, Dec. 13, 1979, abandoned. This application May 13, 1982, Ser. No. 377,750**

**Int. Cl.³ F04B 7/06**

**U.S. Cl. 417—500** **6 Claims**



1. A positive displacement valveless pump comprising:

a cylinder member having a closed head end and a plurality of ports opening through the sidewall of said cylinder, said ports being in a single radial plane and defining alternate intake and exhaust ports;

a piston member operable within said cylinder member in concurrent reciprocating and rotating motion, said piston member seating against said cylinder head at the end of a compression stroke to minimize dead volume;

a first void in the piston extending along the piston wall from the head of the piston and transversing circumferentially the piston wall a distance less than a distance between adjacent cylinder ports;

a second void, this second void extending across the piston head to the first void; and

a sinusoidal cam track and cam follower operative between the cylinder wall and the piston to define the stroke length and said concurrent reciprocating and rotating motion of the piston relative to the cylinder.

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**4,479,760**

**ACTUATOR APPARATUS FOR A PREPACKAGED FLUID PROCESSING MODULE HAVING PUMP AND VALVE ELEMENTS OPERABLE IN RESPONSE TO APPLIED PRESSURES**

**Arnold C. Bilstad, Deerfield; Richard I. Brown, Northbrook, and Robert J. Kruger, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 28, 1982, Ser. No. 453,920**

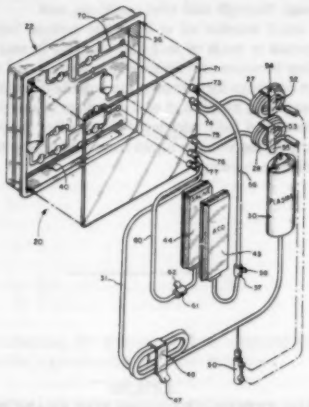
**Int. Cl.³ A61M 1/03**

**U.S. Cl. 417—395** **13 Claims**

1. Fluid processing apparatus for use in conjunction with a fluid module of the type including a housing, a panel member including an outwardly depressed portion therein, and a relatively flexible fluid-impermeable sheet member within the housing overlying the panel member and forming in conjunction with the depressed portion a fluid circuit including an element responsive to displacement of a portion of said sheet member in response to an applied pneumatic pressure, said fluid processing apparatus comprising:

an actuator station for receiving and fixedly positioning said housing; and

actuator means in operative engagement with said flexible sheet member and including pneumatic port means for



applying a pneumatic pressure to said sheet member portion to control fluid flow in the fluid circuit.

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**4,479,761**

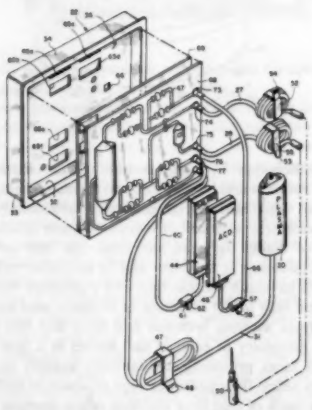
**ACTUATOR APPARATUS FOR A PREPACKAGED FLUID PROCESSING MODULE HAVING PUMP AND VALVE ELEMENTS OPERABLE IN RESPONSE TO EXTERNALLY APPLIED PRESSURES**

**Arnold C. Bilstad, Deerfield; Richard I. Brown, Northbrook, and Robert J. Kruger, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 28, 1982, Ser. No. 453,921**

**Int. Cl.³ A61M 1/03**

**U.S. Cl. 417—395** **11 Claims**



1. Fluid processing apparatus for use in conjunction with a fluid module of the type including a housing having an access port in a panel thereof;

a first relatively-inflexible fluid-impermeable sheet member positioned within the housing, the first sheet member including an outwardly depressed portion therein which faces the housing panel;

a second relatively flexible fluid-impermeable sheet member positioned within the housing between the first sheet member and the housing panel, the second sheet member forming in conjunction with the depressed portion of the

first sheet member a fluid circuit including an element actuable by a pneumatic force applied to the second sheet member through the panel access port, said fluid processing apparatus comprising:

an actuator station for receiving and fixedly positioning said housing; and

actuator means extending through said panel access port in operative engagement with said second flexible sheet member and including pneumatic port means for applying a pneumatic force to said second sheet member to control fluid flow in the fluid circuit.

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**4,479,762**

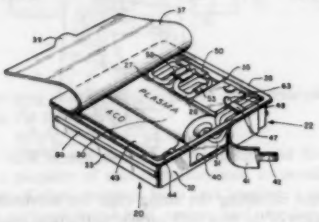
## PREPACKAGED FLUID PROCESSING MODULE HAVING PUMP AND VALVE ELEMENTS OPERABLE IN RESPONSE TO APPLIED PRESSURES

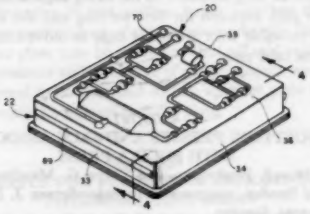
**Arnold C. Bilstad, Deerfield; Richard I. Brown, Northbrook, and Robert J. Kruger, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 28, 1982, Ser. No. 453,926**

**Int. Cl.³ A61M *1/03***

**U.S. Cl. 417—395** **46 Claims**



1. A fluid module for use in a fluid procedure, comprising:

a housing open at one end, including a removable cover overlying said open end; and

a relatively flexible fluid impervious sheet member within said housing forming in conjunction with said housing a fluid circuit including at least one pump element actuable in response to an applied pressure.

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**4,479,763**

## ROTARY COMPRESSOR

**Hiroshi Sakamaki, Tochigi, and Yukio Horikoshi, Saitama, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan**

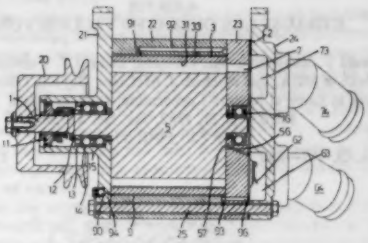
**Filed Oct. 7, 1982, Ser. No. 433,368**

**Claims priority, application Japan, Oct. 13, 1981, 56-162025**

**Int. Cl.³ F04C *18/00***

**U.S. Cl. 418—144** **10 Claims**

1. A rotary compressor comprising a center housing, two side housings, a rotary sleeve rotatably mounted in said center housing, a rotor eccentrically contained in said rotary sleeve, a plurality of vanes movably fitted in said rotor, a discharge chamber provided in said side housing, a pressure chamber defined by and between said rotary sleeve and said center housing and connected to said discharge chamber through at least a high-pressure passage, said high-pressure passage being disposed in the center housing and communicating with a passage extending to and along the side surface of said center housing, through said side housing and communicating with said discharge chamber, said high-pressure passage opening to said pressure chamber through at least one throttle means, whereby said rotary sleeve is floatingly supported by at least one of the static pressure of said pressure chamber and the dynamic pressure of fluid flowing through said throttle means from said high-pressure passage to said pressure chamber.



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**4,479,764**

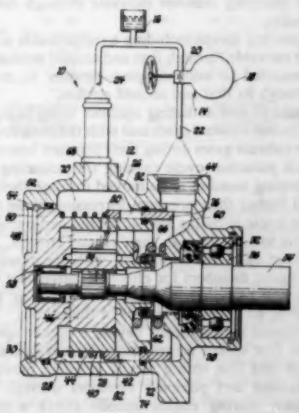
## DEMAND RESPONSIVE HYDRAULIC PUMP

**Stanley E. Anderson, Saginaw, and Leonard N. Franklin, Jr., Reese, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 9, 1983, Ser. No. 473,660**

**Int. Cl.³ F04B *49/02, 49/08***

**U.S. Cl. 417—299** **2 Claims**



1. A demand responsive hydraulic fluid pump for power steering systems comprising; inlet port means; outlet port means; pump means including rotor means, cam ring means and vane means for accepting low pressure fluid from said inlet port means and delivering high pressure fluid to said outlet port means; said cam ring means having controlled aperture means for communicating high pressure fluid from said outlet port means to said inlet port means; and valve means including a sleeve member surrounding said cam ring means and having one end exposed to low inlet pressure and the other end exposed to high outlet pressure means and spring means engaging said sleeve member and acting in assisting relation to the inlet

pressure, said valve means being normally conditioned for permitting fluid flow through said controlled aperture means and being responsive to pressure demand at said outlet port for reducing the flow through said controlled aperture means with increased outlet pressure so that increased output flow will occur.

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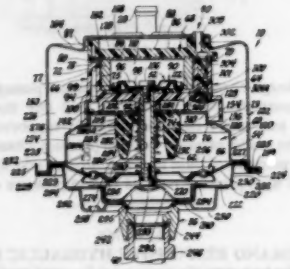
**4,479,765**

## EXHAUST GAS OPERATED VACUUM PUMP ASSEMBLY

**Gerald F. Robertson, Mt. Clemens; Donald J. Pozniak, Utica, both of Mich., and Michael J. McClain, Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 29, 1982, Ser. No. 427,650**
**Int. Cl.³ F04B *35/00***
**U.S. Cl. 417—380** **11 Claims**



1. In combination, a pump assembly and an internal combustion engine which generates exhaust gases having pressure pulsations of varying pressure, frequency and amplitude at different engine speeds, said pump assembly comprising:

a pump means for pumping a fluid and including a reciprocable pumping member movable through first and second strokes,

an actuating means including a reciprocable actuating member movable through first and second strokes and which is connected to said pumping member to move the same through its first and second strokes,

one side of said actuating member being in communication with said exhaust gases and with the pressure pulsations of the exhaust gases during their pressure increasing phase of each pulsation cycle causing the actuating member and pumping member to be moved through their first strokes, and during their pressure decreasing phase of each pulsation cycle allowing said actuating and pumping members to be moved through their second strokes,

a first spring means engageable with one of said actuating or pumping members for effecting movement of the actuating and pumping members through their second stroke during all operating speeds of the engine,

and second spring means having a higher spring rate than said first spring means and which is operable in unison with said first spring means to effect movement of said actuating and pumping members through their second strokes during engine speeds above a predetermined speed.

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**4,479,766**

## APPARATUS FOR THE PRODUCTION OF PLASTIC FILM

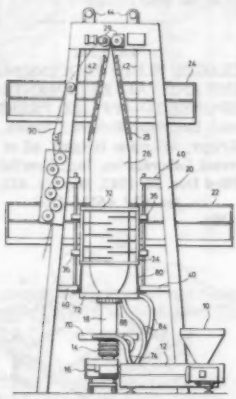
**Mirek Planeta, Burlington, Canada, assignor to Macro Engineering Company, Mississauga, Canada**

**Filed Jun. 14, 1983, Ser. No. 504,184**
**Int. Cl.³ B29C *25/00*; B29D *7/20***
**U.S. Cl. 425—72 R** **6 Claims**

1. Apparatus for the production of plastic film by the extrusion of a tube of molten plastics material from a die outlet of a die in a tube path having a tube longitudinal axis, the apparatus comprising:

a first air ring adapted to be mounted in the immediate neighbourhood of the die outlet surrounding the tube path,

a sizing cage adapted to surround the tube path and receive the tube of cooled material and to constrain it transversely during longitudinal movement in the tube path through the cage,



means mounting the sizing cage for movement longitudinally of the tube path parallel to the tube longitudinal axis, and

a second air ring mounted on the sizing cage to surround the tube path between the first air ring and the sizing cage, and movable with the sizing cage to move longitudinally of the tube path.

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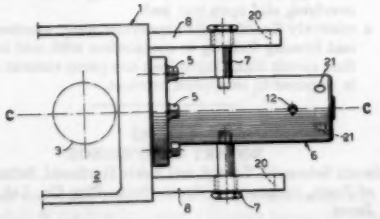
**4,479,767**

## BRIQUETTING PRESSES AND JACK ASSOCIATED WITH SUCH A PRESS

**Jarl O. Mared, Huskvarna, and Elwyn G. Mandley, Tenhult, both of Sweden, assignors to Ingenjorsfirman J. Mared AB, Huskvarna, Sweden**

**Filed Sep. 13, 1982, Ser. No. 417,549**
**Claims priority, application Sweden, Sep. 28, 1981, 8105709**
**Int. Cl.³ B30B *11/22***
**U.S. Cl. 425—186** **10 Claims**



1. A briquetting press comprising a machine frame, a wear ring, a press cone, an end tube and a press cylinder surrounding the press cone, fastening means for securing the end tube to said machine frame substantially co-axially therewith, wherein the press comprises suspension means including a pair of brackets projecting from the machine frame, the press cylinder being suspended so that said press cylinder is displaceable away from

the machine frame together with the press cone and the end tube.

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**4,479,768**

## SEALABLE DISCHARGE DIE FOR THERMOPLASTIC

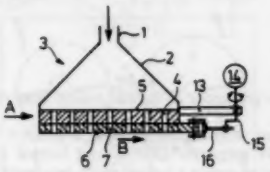
**Wolfgang Kube, Ludwigshafen; Robert Kegel, Frankenthal; Guenter Valentin, and Dieter Staufer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Apr. 28, 1983, Ser. No. 489,498**

**Claims priority, application Fed. Rep. of Germany, May 3, 1982, 8212640[U]**

**Int. Cl.³ B29F *3/08***

**U.S. Cl. 425—192 R** **4 Claims**




1. An improved sealable discharge die for thermoplastics said discharge die comprising:

a housing;

a dieplate fixed to and closing said housing, said dieplate having a plurality of spaced perforations to permit the discharge of plastic strands from said housing; a sealing member plate slidingly held against said dieplate, said sealing member plate having a plurality of orifices which may be aligned with the perforations of said dieplate and the dimension of said orifices being less than the space between perforations of said dieplate whereby the sealing member plate may be moved to shut off said perforations and terminate said discharge of plastic strands; and springs positioned to contact said sealing member plate and urge same sealingly against said die plate.

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**4,479,769**

## APPARATUS FOR PRODUCING ARTICLES FROM THERMOSETTING RESIN

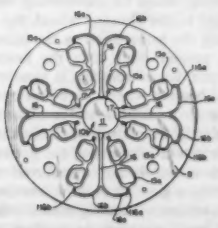
**Francesco Simioni, Padua, Italy, assignor to Saffilo S.p.A., Pieve di Cadore, Italy**

**Division of Ser. No. 046,505, Jun. 7, 1979, Pat. No. 4,362,685. This application Mar. 24, 1981, Ser. No. 247,051**

**Claims priority, application Italy, Jun. 30, 1978, 25185 A/78**

**Int. Cl.³ B29C *5/04***

**U.S. Cl. 425—434** **6 Claims**



1. An apparatus for molding a resin material in a mold having at least one article impression wherein said article impression is disposed in a centrifugal field about an axis of rotation comprising in combination:

a circular mold, arranged so that said axis of rotation is vertical, including a top half-mold above a bottom half-mold;

means for rotating the mold around the vertical axis;

a number of impressions formed in said circular mold;

casting well means at the center of said mold, coaxial with the vertical axis of rotation and accessible from the exterior of said top half-mold for receiving resin during rotation of said mold;

a number of ducts radially formed in one of said half-molds and extending to near the mold periphery, each duct being in liquid communication with the casting well at one end and with a radially outward portion of at least one of the impressions at the other end wherein during rotation of said mold said resin to be molded is supplied to a radially outward portion of said article impression in a centrifugal field and said resin fills said article impression in said centrifugal field in a direction substantially toward said axis of rotation;

at least one cavity for each impression formed in said top half-mold near the casting well and communicating at the bottom with the respective impression and at the top with the environment outside the mold, the cavity being used to form a corresponding feed head for making up for shrinkage due to the setting of the resin; and

means for heating the mold to a predetermined operating temperature.

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**4,479,770**

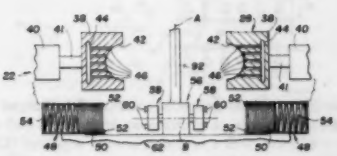
## IN-MOLD LABEL DISPENSER FOR BLOW MOLDING MACHINE

**William A. Slat, Brooklyn, Mich.; Richard C. Darr, Seville, Ohio; Richard L. Dunlap, Cairo, Ohio, and Craig A. Larson, Westfield Court, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.**

**Filed Dec. 8, 1982, Ser. No. 447,872**

**Int. Cl.³ B29C *5/06, 27/14***

**U.S. Cl. 425—503** **12 Claims**



1. An in-mold label dispenser for a blow molding machine including a plurality of molds, each mold including mold sections movable between open and closed positions, and the mold sections including cavity sections which cooperatively define a cavity in which the molding is performed with the mold sections in the closed position and which permit ejection of a molded part in the open position, the label dispenser comprising: a label magazine for storing labels; a base; a dispensing head mounted on the base for rectilinear movement along a first axis from adjacent the label magazine to between the mold sections of a mold in the open position; a label carrier mounted on the dispensing head for rectilinear movement along a second axis transverse to the first axis between retracted and extended positions; and a dispensing head and label carrier drive mechanism including first and second solid mechanical drives, the first solid mechanical drive extending from the base to the dispensing head and being operable to provide movement of the dispensing head back and forth between the label magazine and the mold sections of said mold in the open position, the second solid mechanical drive extending between the base and the label carrier and being operable to provide movement of the label carrier between its extended and retracted positions, said second drive including at least one elongated support on which the dispensing head is supported for move-

ment along the length of the support between the label magazine and said mold, said elongated support having a longitudinal axis and being mounted on the base for rotation about its longitudnal axis, and the second drive also including means connecting the elongated support and the label carrier to provide the movement of the label carrier between the extended and retracted positions upon rotation of the elogated support, the first and second drives of the drive mechanism cooperating to move the dispensing head and label carrier during the cyclical operation that: (a) initially moves the label carrier from the retracted position to the extended position with the dispensing head adjacent the label magazine such that the label carrier receives a label from the magazine, (b) thereafter moves the label carrier to the retracted position with the label thereon and also moves the dispensing head to between the mold sections of said mold in the open position, (c) subsequently moves the label carrier to the extended position to deposite the label on one of the mold sections within the cavity section thereof, and (d) finally moves the label carrier back to the retracted position and moves the dispensing head from between the mold sections back to adjacent the label magazine in preparation for the next cycle.

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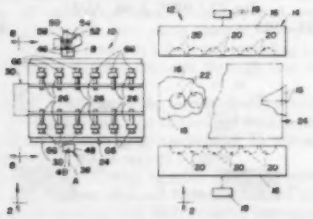
## 4,479,771
## IN-MOLD LABEL DISPENSER FOR MULTIPLE CAVITY BLOW MOLDING MACHINE

**William A. Slat, Brooklyn, Mich.; Richard C. Darr, Seville, Ohio; Richard L. Dunlap, Cairo, Ohio, and Craig A. Larson, Westfield Court, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.**

**Filed Oct. 20, 1983, Ser. No. 543,601**
**Int. Cl.³ B29C** *5/06, 27/14*
**U.S. Cl. 425—503** **16 Claims**



1. An in-mold label dispenser for a blow molding machine which includes a mold having a pair of mold sections that are movable between open and closed positions and define a plurality of cavity sections that cooperatively define a plurality of mold cavities in the closed position, the label dispenser comprising: a dispensing head mounted for movement between a withdrawn position free of the mold and an inserted position between the mold sections in the open position; a plurality of label carriers mounted on the dispensing head for movement between retracted and extended positions; said label carriers being respectively located in alignment with the cavity sections of the mold sections in the open position upon movement of the dispensing head to the inserted position; a label magazine having a single stack of labels for supplying labels to a plurality of associated label carriers prior to movement of the dispensing head from the withdrawn position to the inserted position; and a drive mechanism that initially moves the dispensing head adjacent said label magazine and hesitates as each of the label carriers associated therewith moves into alignment with said label magazine whereupon the drive mechanism moves the aligned label carrier between the retracted and extended positions to secure a label thereto such that labels are secured to the associated label carriers one at a time from said label magazine, the drive mechanism thereafter moving the dispensing head between the withdrawn and inserted positions and also moving the label carriers between the retracted and extended positions to deposit the labels from the magazine within the mold cavity sections in preparation for molding.

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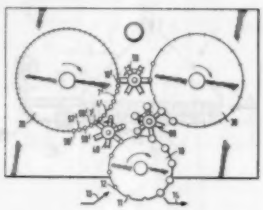
## 4,479,772
## BLOW MOLDING MACHINE EMPLOYING ROTATABLY DRIVEN WHEELS

**Günter Kleimenhagen, Hamburg, Fed. Rep. of Germany, assignor to Krupp Corpoplast Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany**

**Filed Jul. 9, 1982, Ser. No. 396,888**
**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130129**
**Int. Cl.³ B29C** *17/07*
**U.S. Cl. 425—526** **3 Claims**



1. Blow molding apparatus comprising a rotatable blowing wheel having a plurality of equally spaced mandrel receiving stations at the periphery thereof,

a rotatable heating wheel having a plurality of equally spaced mandrel receiving stations at the periphery thereof,

the number of mandrel receiving stations on the heating wheel being greater than the number of stations on the blowing wheel and equal to $nZ \pm 1$ wherein $n \geq 2$ and Z is an integer,

a rotatable supply wheel having a plurality of equally spaced mandrel receiving stations at the periphery thereof, the mandrel receiving stations on the rotatable supply and blowing wheels having the same pitch,

a first rotatable transfer wheel between the supply wheel and the heating wheel for transferring mandrels one by one, in succession, from the supply wheel to the transfer wheel, the transfer wheel having the same pitch as the supply wheel and a greater pitch than the heating wheel, the transfer wheel rotating in synchronism with the supply and heating wheels such that the mandrels which are taken one by one, in succession, by the transfer wheel from the supply wheel, are deposited in every nth mandrel receiving station on the heating wheel,

a second rotatable transfer wheel between the heating wheel and the blowing wheel for transferring mandrels from the heating wheel to the blowing wheel, the second transfer wheel having the same pitch as the blowing wheel and therefore a greater pitch than the heating wheel, said second transfer wheel rotating in synchrouism with the blowing and heating wheels such that every nth mandrel is taken from the heating wheel in offset relation relative to the deposit of the mandrels by the first transfer wheel so that is requires n revolutions of the heating wheel before the supplied mandrels are transferred to the blowing wheel whereby a parison on each mandrel will undergo heating by a stationary heating means n times resulting in a relatively small temperature gradient across the wall thickness of the parison, and

a third rotatable transfer wheel having the same pitch as the blowing wheel for removing the mandrels one by one from successive stations on the blowing wheel,

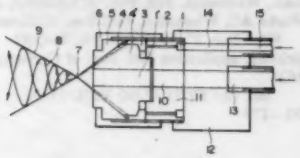
whereby the transfer wheels are driven at uniform speed without delayed or accelerated motions.

4,479,773

## COMBUSTION METHOD AND DEVICE

Shigetake Tamai, No. 4648-90, Ikuta, Tama-ku, Kawasaki-shi, Kanagawa, Japan

Filed Oct. 10, 1980, Ser. No. 195,803
Claims priority, application Japan, Jun. 23, 1980, 55-83977
Int. Cl.³ F23Q 9/00
U.S. Cl. 431—9 2 Claims




1. A combustion device having an atomizing nozzle comprising:

means for forming a plurality of gas flow paths each of which is formed by coaxially arranging two different circular truncated cones having a common vertex and by projecting two different flow paths among flow lines extending to the sink point of a dipole onto the surfaces of said circular truncated cones to form upper and lower bases thereof, said gas flow paths being arranged in such a manner that the focal point of said gas flow paths coincides with the sink point of said dipole at the vertex of said circular truncated cones; and

a fuel path extending straightly along the axis of said circular truncated cones in such a manner that the axis of said fuel path passes through said focal point wherein fuel atomized at said focal point is burned only in a conical region which is formed by gas flows which run along said gas flow paths to concentrate at said focal point.

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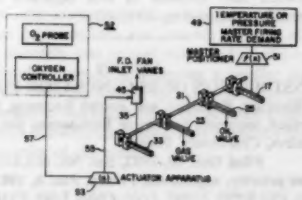
4,479,774

## COMBUSTION CONTROL SYSTEM

Donald M. Stough, Jackson, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1982, Ser. No. 392,978
Int. Cl.³ F23N 5/00
U.S. Cl. 431—76 16 Claims




1. A combustion control system for a combustion apparatus supplied with fuel which is mixed with an intake of a combustive agent, including oxygen, said combustion apparatus having a master member movably mounted about a first axis for regulating the amount of fuel supplied, a slave member movably mounted about a second axis for regulating the amount of combustive agent intake and an intermediate linkage strut having a fixed longitudinal dimension connected between said master member and said slave member for establishing a master-slave relationship for travel through relative predetermined arcs of travel which provides a fixed combustive agent to fuel ratio, said combustion control system comprising:

a linkage strut adjustor apparatus, longitudinally expandable and contractable, in mechanical communication with said intermediate linkage strut to modify the longitudinal dimension thereof such that said master slave relationship is a function of said adjustor apparatus;

actuator means for effecting said longitudinal expansion and contraction of said linkage strut adjustor apparatus, remotely disposed relative to said linkage strut adjustor apparatus and in mechanical communication therewith, wherein the actuator means is in mechanical communication with the adjustor apparatus by means of a cable means whereby said remotely disposed actuator means effects the modification of the longitudinal dimension of the adjustor apparatus by said cable means.

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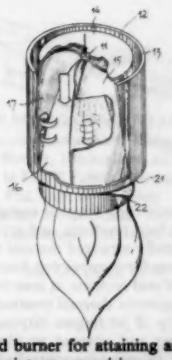
4,479,775

## VANE STRUCTURE BURNER FOR IMPROVED AIR-FUEL COMBUSTION

Yitzhak Wiesel, Motza Ilit, Israel, assignor to Sivan Development and Implementation of Technological Systems Ltd., Tel Aviv, Israel

Filed Sep. 15, 1982, Ser. No. 418,419
Claims priority, application Israel, Dec. 4, 1981, 64452
Int. Cl.³ F23D 15/04
U.S. Cl. 431—353 6 Claims




1. An improved burner for attaining an improved combustion of a fuel-air mixture comprising an elongated cylindrical sleeve (13) having a central axis and a first end and a second end extending transversely of the central axis, a circular plate (14) located within said sleeve adjacent the first end thereof and extending transversely of the central axis, said circular plate having a circular circumferential edge spaced radially inwardly from said sleeve and forming in combination with said sleeve an annular first opening, an annular plate-like member (23) located at the second end of said sleeve and connected to said sleeve and extending transversely of the central axis, said annular plate-like member extending radially inwardly from said sleeve, said annular plate-like member (23) having a radially inner edge spaced inwardly from said sleeve defining a second opening, six vanes (15–20) located within said sleeve and extending approximately in the direction of the central axis from said circular plate (14) to said annular plate-like member (23), each said vane having a first end at said circular plate (14), a second end at said plate-like member (23), a first edge extending between said first and second ends in the direction of and adjacent to the central axis of said sleeve, and a second edge extending between said first and second ends in the direction of the central axis and spaced radially outwardly from said first edge and radially inwardly from said sleeve, said vanes extending radially outwardly from the first edges to the second edges in angularly spaced relation with the space between adjacent said vanes increasing from the first edges to the second edges, said second edges of said vanes are located on a circle spaced radially inwardly from said sleeve with an axially extending

annular space located between said second edges and said sleeve and extending from said annular first opening to said annular plate-like member (23), the second edges of adjacent said vanes defining openings in communication with said annular space, a nozzle (11) located on said circular plate (14) coaxial with the central axis of said sleeve for supplying fuel through said circular plate into said sleeve in the area of said first edges of said vanes, said second ends of adjacent said vanes forming outlet openings from the space between adjacent said vanes to the second opening from said sleeve, whereby air is introduced through said annular first opening and the fuel introduced through said nozzle (11) effect an intimate mixture of the air and fuel within the axial area of said vanes with the fuel-air mixture exiting from said sleeve and undergoing combustion at the second opening from said sleeve.

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**4,479,776**

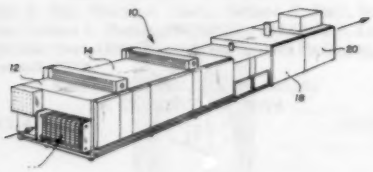
## THERMAL TREATMENT OF FOOD PRODUCTS

**Donald P. Smith, P.O. Box 340530, Dallas, Tex. 75234**

**Continuation-in-part of Ser. No. 286,060, Jul. 22, 1981, Pat. No. 4,409,453. This application Jan. 22, 1982, Ser. No. 341,640**

**Int. Cl.³ F27B *9/00***

**U.S. Cl. 432—144** **4 Claims**




1. Apparatus for imparting thermal energy to or removing thermal energy from food products, said apparatus comprising a plurality of sequentially arranged thermal treatment sections and a conveying means for transporting food products sequentially through each of said sections; at least one of said sections comprising an impingement thermal treatment section further comprising a plurality of jet fingers disposed transversely to said conveying means and adapted to direct a plurality of columnated jets of a temperature-controlled gaseous medium substantially perpendicularly against said conveying means so as to impinge against the exterior surface of a food product moving relative to said columnated jets of gas on said conveying means, thereby imparting to or removing from the surface of said food product a portion of the thermal energy that is desired to be imparted to or removed from said food product, duct means communicating with said jet fingers and adapted to direct the flow of said temperature-controlled gaseous medium thereto, plenum means adapted to distribute said temperature-controlled gaseous medium to said duct means, cabinet means adapted to support said jet fingers, duct means and plenum means so as to define a cooking chamber around said conveying means, blower means disposed within said cabinet means and adpated to discharge said temperature-controlled gaseous medium into said plenum means; and at least one of said thermal treatment sections comprising an equilibrating section adapted to contact the exterior surface of a food product transported on said conveying means with a temperature-controlled gaseous medium flowing in a direction substantially parallel to said conveying means, said equilibrating section further comprising an equilibrating chamber defined by cabinet means having top, bottom, front, back and side walls, duct means disposed within said cabinet means communicating with the plenum means of said impingement thermal treatment section and adapted to discharge said temperature-controlled gaseous medium in a direction substantially parallel to said conveying means within said equilibrating chamber, means for controlling the flow of said temperature-controlled gaseous medium through said duct means, and curved baffle means disposed opposite to said duct means within said cabinet means, said curved baffle means being adapted to circulate the temperature-controlled gaseous medium discharged from said duct means within said equilibrating chamber.

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**4,479,777**

## HEADER BRICK IN REGENERATOR LATTICE STRUCTURE

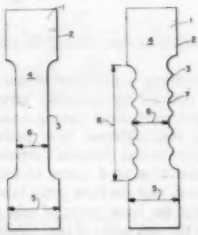
**Günter Simon, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany**

**Filed Dec. 27, 1982, Ser. No. 454,182**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211624**

**Int. Cl.³ F27D *17/00*; F23L *15/02***

**U.S. Cl. 432—179** **11 Claims**



1. In a freely diagonally staggered regenerator lattice structure of the type including successive courses of rows of rectangular runner bricks and courses of rows of rectangular header bricks, the improvement wherein:

each said header brick has formed in opposite side surfaces thereof recesses extending from a lower surface thereof to an upper surface thereof, each said recess being at least partially formed by a plurality of grooves, such that laterally outermost surfaces of said brick in the area of each of said recess are located inwardly of the respective said side surface of said brick;

the height of each said header brick is 55 to 60% of the sum of the height of said header brick and the height of a said runner brick;

the height of each said runner is 40 to 45% of said sum; and

the width of each said header brick, in the area thereof between said recesses in said opposite side surfaces thereof, is reduced by 20 to 40%.

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**4,479,778**

## CONSTRUCTION OF REGENERATOR FURNACES

**Pierre Blanchet, Boulogne, and Joseph Recasens, Sorgues, both of France, assignors to Societe Europeenne des Produits Refractaires, Courbevoie, France**

**Filed Dec. 20, 1982, Ser. No. 451,436**

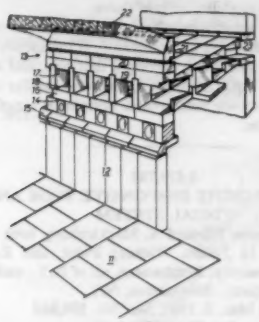
**Claims priority, application France, Jan. 8, 1982, 82 00185**

**Int. Cl.³ F27D *17/00, 1/16*; C03B *5/00*; F23D *11/44***

**U.S. Cl. 432—180** **10 Claims**

1. In a regenerator furnace which comprises a hearth, a vault extending over the hearth, a lateral wall extending upwardly from the hearth toward the vault and a lateral superstructure wall extending upwardly from the lateral wall to the vault, a regenerator head behind the lateral superstructure wall, at least two burner pipes extending from the regenerator head to the lateral superstructure wall so as to communicate with the area between the hearth and the vault, and fuel-injecting means cooperating with the burner pipes, the improvement wherein each burner pipe has a generally rectangular cross section and includes refractory base elements and monolithic refractory cover elements, and wherein a common refractory port side

wall is located between adjacent burner pipes, the common refractory port side wall resting on the refractory base elements of adjacent burner pipes and supporting the refractory



cover elements of adjacent burner pipes, said base elements and said cover elements being of sufficient extent to span the distance between adjacent port side walls.

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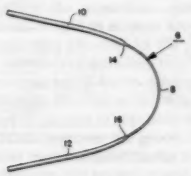
**4,479,779**

## ORTHODONTIC ARCH WIRE

**Arthur L. Wool, 1402 Penn Ave., Wyomissing, Pa. 19610**

**Filed Sep. 30, 1983, Ser. No. 537,742**
**Int. Cl.³ A61C *7/00***
**U.S. Cl. 433—20** **10 Claims**



1. An orthodontic arch wire having solid posterior segments having circular cross-sections and smooth surfaces allowing them to slide smoothly into buccal tubes, and a solid anterior segment of circular cross-section having a smaller diameter than that of the cross-sections of the posterior segments, the anterior and posterior segments being unitary and continuous, and the transition between the posterior and anterior segments being in the vicinity of the canines.

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**4,479,780**

## APPARATUS FOR POSITIONING A DENTAL DOWEL

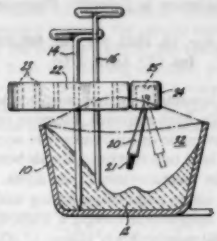
**Kenneth W. Gores, 1026 - 112th St. N.E., Bellevue, Wash. 98004**

**Filed Aug. 8, 1983, Ser. No. 521,374**
**Int. Cl.³ A61C *19/00***
**U.S. Cl. 433—74** **6 Claims**

1. A bridging member for suspending a dental dowel pin upright in a tooth impression cavity of a dental impression, comprising;

a main body member adapted to slidably receive upright pin means for support thereby in spaced relation above a tooth impression cavity;

said main body member having a secondary body member joined thereto and provided with a slot-like socket to receive and suspend a dowel into said tooth impression cavity;



whereby said slot-like socket permits suspension of a dowel at various angular dispositions relative a vertical axis.

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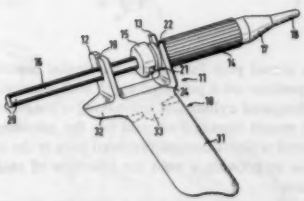
**4,479,781**

## DISPENSER FOR METERING DENTAL COMPOSITIONS

**Wolf-Dietrich Herold, Hechendorf; Rainer Grimm-Lenz, Seefeld, and Bernd Burger, Hechendorf, all of Fed. Rep. of Germany, assignors to ESPE Fabrik pharmazeutischer Präparate GmbH, Seefeld, Fed. Rep. of Germany**

**Filed Mar. 23, 1983, Ser. No. 478,035**
**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212187**
**Int. Cl.³ A61C *5/04***
**U.S. Cl. 433—90** **16 Claims**



1. A dispenser for metering dental compositions, comprising

(a) a casing with a dispensing opening,

(b) a plunger movable within said casing, the space defined between the plunger and said dispensing opening serving to accomodate the dental composition,

(c) a threaded spindle which acts on said plunger and is axially movable relative to said casing,

(d) a nut fixed to said casing and engaging said spindle, said casing and nut being rotatable relative to said spindle for advancing the same, said casing, plunger, spindle and nut forming an assembly, and

(e) a manipulating member formed as a separate part and including means removably receiving said assembly such that said spindle is supported non-rotatably but axially movable relative to the manipulating member and said casing is secured against axial movement but supported rotatably relative to the manipulating member.

4,479,782

## VISIBLE LIGHT-CURED ORTHODONTIC ADHESIVE

Jan A. Orlowski, Altadena, and David V. Butler, West Covina, both of Calif., assignors to Scientific Pharmaceuticals, Inc., Duart, Calif.

Filed Apr. 18, 1983, Ser. No. 485,889
Int. Cl.³ A61K 5/06
U.S. Cl. 433—220 25 Claims

1. A method of bonding an orthodontic bracket to a human tooth with a visible light-activated adhesive comprised of a mixture of (1) an aromatic or hydroaromatic acrylate or methacrylate having at least two ethylenic double bonds with (2) an aliphatic acrylate or methacrylate, (3) an alpha, beta diketone and (4) a tertiary amine comprising curing said adhesive by irradiation with a light source having a white-light output in the range of 380–500 nanometers of at least 25,000 foot candles, such light being applied to the occlusal surface of the tooth or to the side opposite to the side on which the bracket is placed.

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4,479,783

## HELICALLY FLUTED DENTAL POST

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,942
Int. Cl.³ A61C 5/08
U.S. Cl. 433—221 8 Claims

1. A dental post for retaining a dental restoration in a secured position on a prepared tooth stub, comprising:

an elongated cylindrical pin having a longitudinal axis;

flute means disposed on said pin for retaining said pin secured within a cement prepared bore in the tooth stub, and also to provide a vent for insertion of said pin into the bore;

said flute means including a plurality of external, spaced apart helical flutes;

said flutes being longitudinally disposed about said longitudinal axis of said pin;

each of said helical flutes providing a separate spiral path about said pin;

said pin having a major exterior diameter, and said flutes cut into said pin to a respective depth defining at least one minor diameter so that at any cross sectional taken along said longitudinal axis of said pin there exists a greater peripheral length at said major diameter than at said minor diameter;

said depth of said flutes being smaller than the spacing between adjacent flutes;

said pin having a predetermined length so that an upper portion of said pin extends outwardly from the tooth stub upon which the restoration can be secured when said pin is inserted into the tooth stub bore;

said flutes having a pitch greater than said predetermined length of said pin so that said separate spiral path of each of said flutes is less than one revolution about said pin to define said vent;

said pitch providing a pitch angle of less than 10 degrees with respect to said longitudinal axis of said pin to maintain venting capability of said flutes;

said pitch being approximately one revolution per inch, and said pin length being approximately 0.750 inches; and

a first group of said flutes having a first size, and a second group of said flutes having a second size smaller than said first size to provide said greater peripheral length at said major diameter.

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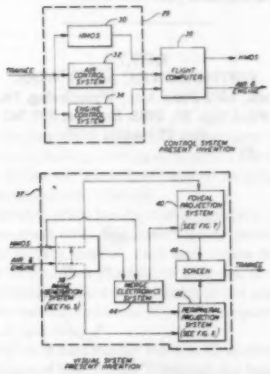
4,479,784

## EYE LINE-OF-SIGHT RESPONSIVE WIDE ANGLE VISUAL SYSTEM

Richard B. Mallinson; Richard A. Mecklenborg, both of Binghamton; David L. Peters, Whitney Point, and Kadam S. Lakshminarayanasetty, Binghamton, all of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Mar. 3, 1981, Ser. No. 239,942
Int. Cl.³ G09B 9/08
U.S. Cl. 434—43 6 Claims



1. In a simulator, a visual system for generating a high-resolution visual image over a wide field of view comprising:

image display means;

computer image generator;

means connected to said computer image generator for projecting a visual image of high resolution onto said image display means, the area of said high resolution image being sized to accommodate the foveal viewing area of an observer observing said image display means;

means connected to said computer image generator for projecting a visual image of low resolution onto said image display means encompassing said high-resolution image and sized to accommodate the peripheral viewing area of said observer;

means for merging said high resolution image and said low-resolution image to enhance the optical realism of the overall image, both foveal and peripheral views of the observer;

means for continuously locating the observer's eye line-of-sight relative to a position on said image display means; and

means for continuously positioning the high resolution image substantially at the observer's eye line-of-sight on said display means such that the high resolution image will be encompassed in the foveal viewing area of the observer regardless of where the observer is looking, the transition time of repositioning the high-resolution image from one point on said image display means to another point on the

image display means being less than the saccadic suppression time of the observer.

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**4,479,785**
**LEG ROPE FOR A SURFBOARD**
**Ian D. Tugwood, and Geoffrey D. Tugwood, both of 7 Gunyah Pl., Avalon, New South Wales, Australia**
**Filed Jul. 20, 1982, Ser. No. 400,152**
**Int. Cl.³ A63C *15/06***
**U.S. Cl. 441—75** **3 Claims**

1. A leg rope to connect a surf board to a surfer, said rope comprising a helically coiled extensible member made of resilient material, an anchoring member fixed to one end of the coiled member whereby the extensible member can be anchored to a surf board, a cuff to engage around the leg of a surfer, a swivel connecting the cuff to the other end of the extensible member, said swivel including two components, the first component comprising a body having a hole therethrough, radially disposed grooves across a face of the body in a plane at right angles to the axis of said hole through the body, an arched member extending over the grooved body face with the ends of the arched member fixed to the body and the cuff fixed to the arched member, the second component comprising a swivel including a shank with one end of the shank fixed to the other end of the coiled member, said shank located in the hole through the body of the first swivel component with abundant clearance therebetween, a head on the shank located between the arched member and the grooved face of the first swivel component, radially disposed lugs on the underface of the head on the shank engageable in the radial grooves of the first swivel component, said grooves and lugs being respectively concave and convex and complementarily dimensioned and substantially semi-circular with radiused edges where the grooves meet the face of said body of the first swivel component said grooves and lugs being dimensioned as to prevent relative rotational movements between said components when a tension force is applied and permits relative rotational movements between said components when the tension force is released.

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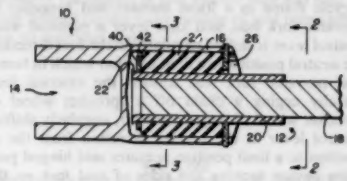
**4,479,786**
**SHAFT ASSEMBLY**
**James G. De Bisschop, Litchfield, Conn., assignor to The Torrington Company, Torrington, Conn.**
**Filed Mar. 7, 1983, Ser. No. 473,038**
**Int. Cl.³ F16D *3/76***
**U.S. Cl. 464—89** **4 Claims**

1. A rotatable shaft assembly for a vehicle comprising: a lower outer rotatable driven member; and upper inner rotatable driving member spaced from the driven member and having a non-circular periphery; an elastomeric bushing located in the space between the driving and driven rotatable members for rotating the driven member in response to driving member rotation; a fail-safe washer connected to the driven member, the washer having a central opening through which the driving member extends, the central opening being dimensioned so that the surface forming the central opening is normally spaced from the driving member, but in the event of elastomeric bushing failure or high torsional load at least a portion of said surface is contacted by the driving member to rotate the driven member; and a retention washer mounted on



the driving member and abutting a lower axial end of the elastomeric bushing, the periphery of the retention washer being radially inwardly spaced from the driven member, the driving member having a protruding portion axially located and shaped to engage a lower axial end of the retention washer upon upward axial movement of the driving member to prevent further axial movement of the driving member, whereby in the event of a collision of the vehicle, upward axial movement of the driving member is limited by contact of said driving member portion against the retention washer.

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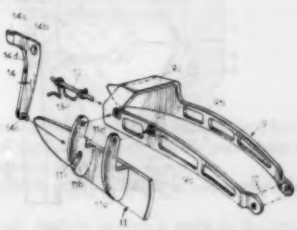
**4,479,787**
**SPEED GEAR DEVICE AT THE CRANK-WHEEL OF BICYCLES AND SIMILAR VEHICLES**
**Pierre Bonnard, Beynes, France, assignor to Etablissements LE SIMPLEX, France**
**Filed Mar. 8, 1982, Ser. No. 355,616**
**Claims priority, application France, Mar. 17, 1981, 81 05786**
**Int. Cl.³ F16H *11/00***
**U.S. Cl. 474—82** **7 Claims**



1. A device for changing gears on a bicycle and similar engines wherein the device is mounted on a fixed support of a bicycle frame adjacent a crank-wheel of a bicycle, gears are changed by transferring a chain from one sprocket to another thereby changing the gearing of a bicycle or similar device, comprising:

a fork having an internal side and an external side between which a chain passes, the spacing between the sides of said fork is substantially larger than the normal spacing for a conventional fork assembly, a chain passing through said fork will not contact either fork side even in the most slanted winding positions of a chain except during a gear changing procedure;

a hinged parallelogram device is secured to a fixed support on a bicycle frame adjacent to the crank-wheel of a bicycle, said parallelogram device supports said fork;

a control lever for said hinged parallelogram device, said control lever is normally positioned in a neutral position but may be angularly shifted in a first direction to a limit position or angularly shifted from the neutral position in the reverse direction to a limit position;

a third movable fork side is movably mounted beneath the internal side of said fork and is provided with an elastic return system and stops in order to maintain said movable fork in an inactive position which is approximately in the plane of the internal fork side and away from the external fork side; and

a pivotal knee lever means hinged to a fixed support on a bicycle frame in a loose manner and hingedly to said movable fork side, said knee lever is pivotted when said control lever is shifted angularly in the first direction from the neutral position to a limit position which in turn moves said movable fork side toward the external fork side thereby urging a chain off a sprocket wheel onto a sprocket wheel of larger diameter, angularly shifting said control lever in the reverse direction from the neutral position to a limit position actuates said hinged parallelogram device moving the sides of said fork so that the external side pulls a chain from a larger sprocket wheel onto a smaller sprocket wheel at the same time said movable fork side is moved toward said external fork side by the combined actions of the internal fork side and said knee lever, said movable fork side after shifting of the chain is returned within approximately the plane of the internal fork side.

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**4,479,788**

## CENTRIFUGE WITH A SELF-EMPTYING DRUM

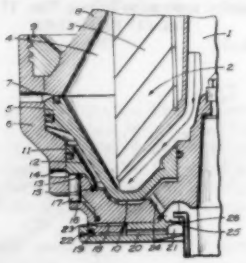
**Werner Kohlstette, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany**

**Filed Oct. 24, 1983, Ser. No. 544,750**

**Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3240998**

**Int. Cl.³ B04B *11/02***

**U.S. Cl. 494—27** **6 Claims**



1. In a centrifuge with a self-emptying drum with ejection openings in its jacket that lead out of a solids space and which can be blocked off with a piston valve having an associated closure compartment chargable with closure fluid, means dividing the closure compartment into an upper and a lower division, and outflow channels leading out of the drum from the lower division of the closure compartment, the improvement wherein the dividing means comprises a disk mounted for axial displacement in the closure compartment between a lower position wherein it hermetically seals off the lower division of the closure compartment from the rest of the compartment and an upper position wherein it permits communication between the lower division and the rest of the closure compartment whereby closure fluid flows out of the closure compartment through its lower division and through the outflow channels, means for hydraulically displacing the disk from the lower to the upper position thereof and wherein the disk is automatically returnable to its lower position to terminate the outflow of closure fluid upon the attainment of a predetermined hydrostatic pressure in the lower division.

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**4,479,789**

## BELL-LIKE CENTRIFUGE DRUM FOR CONTINUOUSLY FREEING METAL TURNINGS OF OIL

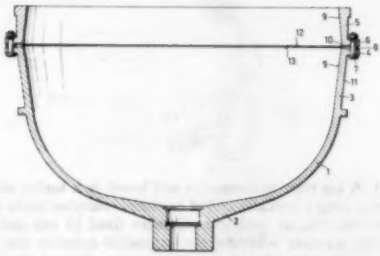
**Richard Steimel, Frankfurter Strasse 134, 5202 Hennef, Fed. Rep. of Germany**

**PCT No. PCT/EP82/00048, § 371 Date Aug. 30, 1982, § 102(e) Date Aug. 30, 1982, PCT Pub. No. WO82/03189, PCT Pub. Date Sep. 30, 1982**

**PCT Filed Mar. 11, 1982, Ser. No. 414,376**

**Int. Cl.³ B04B *1/10***

**U.S. Cl. 494—43** **14 Claims**



1. A centrifuge drum for continuously freeing metal turnings of oil, comprising:

a hollow bottom drum having a floor and an open top portion, said open top portion having a top edge with a fixed diameter;

an outwardly running flange disposed on said top edge of said hollow bottom drum;

a hollw top drum having open bottom and top portions, said open bottom portion having a bottom edge with a fixed diameter, said hollow top and bottom drums having walls with inner and outer faces and have clearance diameters at said bottom and top edges of said hollow top and bottom drums respectively;

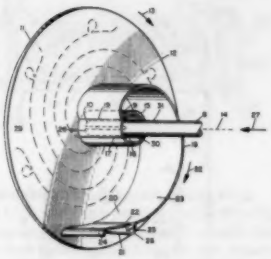
an outwardly running flange disposed on said bottom edge of said hollow top drum, said hollow top drum being removably mounted to said hollow bottom drum at said outwardly running flanges and forming a hollow interior which does not contain any other elements of the centrifuge drum and a circumferential gap between said outwardly running flanges about the periphery of said hollow top and bottom drums, so that the liquid cleared from the metal turnings can be discharged from the centrifuge drum, said gap being formed to completely extend through said walls of said hollow top and bottom drums by stretching from said inner faces of said hollow top and bottom drums and becoming conically wider at said outer faces of said hollow top and bottom drums, said clearance diameter of said lower edge of said gap at said inner face of said drum wall of said hollow top drum being greater than said clearance diameter of said top edge of said gap at said inner face of said drum wall of said hollow bottom drum; and

means for rigidly securing said hollow top and bottom drums.

## 4,479,790
## CENTRIFUGAL SEPARATOR AND METHOD OF OPERATING SAME

Harry G. Bocckino, Fairfield, Conn., and Jon P. Meyer, Golden, Colo., assignors to Texasgulf, Inc., Stamford, Conn.

Filed Apr. 22, 1983, Ser. No. 487,725
Int. Cl.³ B04B 1/00
U.S. Cl. 494—85 20 Claims



1. An apparatus for separating heavy fractions from a material having heavy and light fractions, comprising:

(a) support means;

(b) rotary means for rotably supporting said support means about an axis of rotation;

(c) drive means for imparting a rotary motion to said support means;

(d) feed means introducing the material into the apparatus;

(e) centrifuging surface means extending from positions relatively close to said axis of rotation to positions progressively more removed radially from said axis of rotation, and configured and positioned to receive said material and to impart a rotary motion to said material and subject said material to centrifugal forces, said surface means being further configured to allow only a portion of said centrifugal force to advance said material to radial positions progressively more displaced from the axis of rotation of said support means, or subjecting said material to stratifying centrifugal forces as said material advances toward points on said centrifugal surface relatively more removed from said axis of rotation; and

(f) separator means positioned near the radially outer-most point on said centrifuging surface to remove said heavy fraction.

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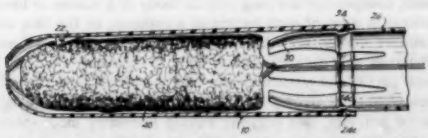
## 4,479,791
## TAMPON APPLICATOR

E. Russell Sprague, Monson, Mass., assignor to Tampax Incorporated, Lake Success, N.Y.

Continuation of Ser. No. 172,556, Jul. 28, 1980, abandoned. This application May 9, 1983, Ser. No. 491,784
Int. Cl.³ A61F 15/00
U.S. Cl. 604—14 1 Claim



1. A catamenial tampon applicator comprising:

an ejector tube adapted to store a tampon therein, the distal end of said ejector tube comprising a plurality of spaced apart fingers;

an outer tube slidably disposed over said ejector tube and having a distal discharge end;

gripping means associated with said outer tube for engaging a tampon carried in said ejector tube so as to resist movement of such a said tampon towards the proximal end of said outer tube while permitting discharge of such a tampon from said distal end; and

restraining means for preventing the disassembly of said ejector tube from said outer tube including a circumferentially extending raised detent means and a mating circumferential groove, respectively formed on the outer distal surface of said ejector tube and on the inner proximal end of said outer tube, said detent means being formed as a series of annularly extending raised ribs formed on the outside of the fingers of said ejector tube and said groove being formed on the inner surface of said outer tube adjacent its proximal end.

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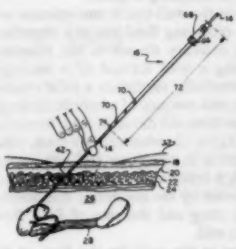
## 4,479,792
## PERITONEAL FLUID TREATMENT APPARATUS, PACKAGE AND METHOD

Harrison Lazarus, 843 13th Ave., Salt Lake City, Utah 84103, and James A. Nelson, 1708 Forest Hills Dr., Salt Lake City, Utah 84106

Continuation of Ser. No. 181,219, Aug. 22, 1980, Pat. No. 4,351,333, which is a continuation of Ser. No. 945,525, Sep. 25, 1978, abandoned, which is a division of Ser. No. 722,752, Sep. 13, 1976, Pat. No. 4,128,173, which is a continuation of Ser. No. 626,323, Oct. 28, 1975, abandoned. This application Sep. 24, 1982, Ser. No. 423,034
Int. Cl.³ A61M 25/00
U.S. Cl. 604—29 6 Claims



1. A method for peritoneal fluid treatment in which:

a portion of the skin surface about the peritoneum is sterilized using skin preparation means;

a local anesthetic is administered to said sterilized skin surface;

a short, small, shallow incision is made in the area of said sterilized skin;

an intravascular catheter of the type having a first cannula connected to a hub and removable placement means is inserted through said incision and into the peritoneal cavity;

the placement means of said intravascular catheter is removed and said first cannula left inserted;

flexible guide means are inserted into the peritoneal cavity through said first cannula;

said first cannula is removed leaving said guide means inserted;

a second cannula which is elongated and flexible is inserted into the peritoneal cavity over said guide means;

said guide means is removed; and

fluid operation means is connected to said second cannula by connector means adapted to one end of said cannula to effect fluid treatment operations.

4,479,793

## PARENTERAL ADMINISTRATION USING DRUG DELIVERY DEVICE

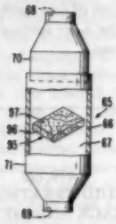
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 325,204, Nov. 27, 1981, Pat. No. 4,424,056. This application Oct. 11, 1983, Ser. No. 540,944

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.³ A61M 5/14

U.S. Cl. 604—85 2 Claims



1. An administration set for use with a parenteral therapeutic system, the administration set comprising:

(a) a primary tube for the flow of a medical fluid therethrough;

(b) a parallel tube in fluid communication with the primary tube for the flow of medical fluid therethrough; and,

(c) a drug formulation chamber in the parallel tube, the chamber comprising;

(1) a wall surrounding a space;

(2) an inlet in the wall that communicates with the parallel tube for receiving fluid into the chamber;

(3) a drug delivery device in the chamber, said device comprising a wall formed of a microporous material that substantially surrounds a solid reservoir containing a dosage unit amount of a beneficial drug that forms on its release from the device a drug formulation with fluid that enters the chamber and wherein, when the administration set is in operation and administering drug to a recipient, a beneficially effective amount of the drug is administered by the combined operations of the device releasing drug and the rate of fluid flow through the chamber; and,

(4) an outlet in the wall for the flow of fluid containing drug from the chamber.

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4,479,794

## SYSTEM FOR INTRAVENOUS THERAPY

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 325,204, Nov. 27, 1981, Pat. No. 4,424,056. This application Oct. 11, 1983, Ser. No. 540,945

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.³ A61M 5/14

U.S. Cl. 604—85 5 Claims

1. An administration set for use with a parenteral therapeutic system, the administration set comprising:

(a) a primary tube for the flow of a medical fluid therethrough;

(b) a parallel tube in fluid communication with the primary tube for the flow of medical fluid therethrough; and,

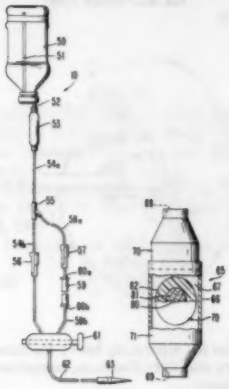
(c) a drug formulation chamber connected to the parallel tube, the chamber comprising:

(1) a wall surrounding a lumen;

(2) an inlet in the wall that communicates with the parallel tube for admitting fluid into the chamber;

(3) a fluid permeable film in the formulation chamber, said film a releasing means formed of a material that releases drug from said chamber in the presence of fluid that enters the chamber;

(4) a drug in a pharmaceutically acceptable solid form in the formulation chamber and present in therapeutically effective amount for executing a prescribed therea-



peutic beneficial program, said drug initially separated from the film, is contacted by fluid that enters the chamber, and is released from said chamber by the film and the fluid that flows therethrough; and,

(5) an outlet in the wall for the flow of fluid containing drug from the chamber.

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4,479,795

## ANTIMICROBIAL POLYMER COMPOSITIONS

Robert V. Mustacich; Donald S. Lucas, and Roger L. Stone, all of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 053,619, Jun. 29, 1979, Pat. No. 4,343,788. This application Jul. 27, 1982, Ser. No. 402,381

Int. Cl.³ A61M 25/00

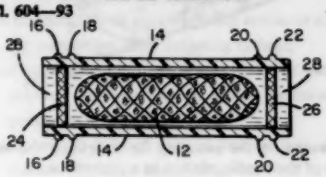
U.S. Cl. 604—53 8 Claims

1. A method for catheterization of humans and lower animals with lowered risk of nosocomial infection by achieving microbial inhibition at and around the placement site of catheters and the like used in the bodies of humans and lower animals, comprising: inserting into the body of a human or lower animal in need of such treatment a catheter, or the like, said catheter comprising: delivery means for transporting liquid materials, said delivery means being in the form of a tube; at least part of the portion of said tube which contacts the body comprising a toxicologically-acceptable, medical-grade elastomeric polymer, said polymer having releasably incorporated within the polymer matrix a safe and effective amount of one or more free n-alkane monocarboxylic acid antimicrobial agents or salts thereof, having from about 4 to about 10 carbon atoms, said polymer containing from about 0.1% to about 40% by weight of a substantially non-antimicrobial proton donor selected from the group consisting of citric acid, tartaric acid, malic acid, fumaric acid, maleic acid, malonic acid, ascorbic acid, barbituric acid, and mixtures thereof.

## 4,479,796
## SELF-REGENERATING DRUG ADMINISTRATION DEVICE

Michael J. Kallok, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 15, 1982, Ser. No. 441,888
Int. Cl.³ A61M 5/00
U.S. Cl. 604—93 10 Claims



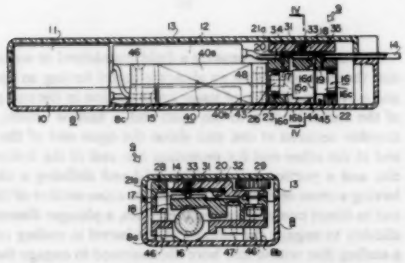

1. An implantable drug dispenser comprising:

a dispenser body having a proximal end and a distal end and a bore running from said proximal to said distal end, said proximal end provided with a first attachment means for attaching said proximal end to a blood vessel, said distal end provided with a second attachment means for attaching said distal end to a blood vessel, said dispenser body further comprised of a cartridge comprising a cartridge body having a proximal end, a distal end, and a central bore connecting said proximal end to said distal end, the bore of said cartridge body in fluid communication with the bore of said dispenser body, wherein said cartridge further comprises retaining means for retaining a colony of drug producing microorganisms within said bore of said dispenser body.

## 4,479,797
## MEDICATION INFUSION DEVICE

Susumu Kobayashi, and Yasuaki Shimojo, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,919
Claims priority, application Japan, Jul. 4, 1981, 56-104819
Int. Cl.³ A61M 5/00
U.S. Cl. 604—153 9 Claims



1. In a device for infusion of liquid medication including a finger-type pump unit, said pump unit comprising a cap and at least three elongate fingers arranged to be displaceable towards said cap in a predetermined sequence, cam means for operating said fingers and rotary drive means for driving said cam means, said fingers being operative to squeeze a feeding tube for infusion of medication when said feeding tube is placed between said cap and said fingers, the improvement wherein

said at least three fingers comprise two side fingers placed in generally parallel relation with and on both sides of at least one central finger, said side fingers each being constructed and arranged to squeeze said feeding tube at corresponding substantially point locations on said feeding tube for collapsing said tube substantially completely at said point locations, and said central finger being constructed and arranged to collapse said feeding tube over a required length between said point locations for pumping medication in the tube,

a support member formed integrally at first ends of each of said fingers for supporting said fingers in cantilevered fashion, said support member being in the form of a support frame at least partially encircling the fingers in substantially the same plane as the fingers and said support member including an integrally formed mounting plate for mounting the rotary drive means,

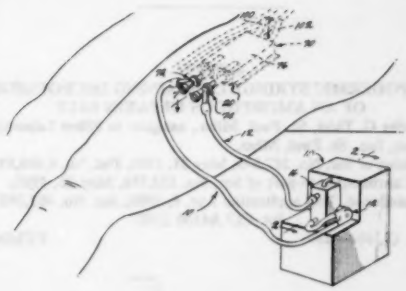
said fingers each having a reduced thickness portion at the first ends thereof in the direction toward said cap, and

a plurality of cams forming said cam means wherein each cam has a specific cam profile and is operatively associated with a corresponding one of said fingers for operating the finger, said cams having a common axis which extends transversely of the axes of said fingers.

## 4,479,798
## SUBCUTANEOUS IMPLANT USEFUL IN EFFECTING HYPERTHERMIC TREATMENT

Leon C. Parks, Baltimore, Md., assignor to Research Against Cancer, Inc., Jackson, Miss.

Division of Ser. No. 068,950, Aug. 23, 1979, , which is a division of Ser. No. 802,033, May 3, 1971, Pat. No. 4,181,132. This application Dec. 4, 1980, Ser. No. 212,750
Int. Cl.³ A61M 1/03
U.S. Cl. 604—175 16 Claims



13. A totally subcutaneous implant for use with an apparatus providing an extracorporeal blood flow path extending from a blood withdrawing percutaneous cannula cooperable with said implant to a blood returning percutaneous cannula cooperable with said implant, said implant comprising:

a body of elastomeric material adapted to be implanted totally subcutaneously in an extremity,

means in said body defining an arterial passage, a spaced venous passage, and a bypass conduit extending from one end of said arterial passage to one end of said venous passage,

an arterial tube of vascular prosthesis material having one end connected in communicating relation with the other end of said arterial passage and an opposite end adapted to be connected in communicating relation with the interior of an extremity artery,

a venous tube of vascular prosthesis material having one end connected in communicating relation with the other end of said venous passage and an opposite end adapted to be connected in communicating relation with the interior of a vein,

means in said elastomeric body extending from a position exterior of said body inwardly thereof to a position in communicating relation with said arterial passage mov-

able between (1) a closed condition excluding fluid containing space within said body between said two positions so that blood flowing from said arterial tube through said arterial passage will pass therefrom through said bypass conduit into said venous passage and out of said venous tube and (2) an open condition excluding fluid receiving space within said body from the exterior periphery of the portion of a blood withdrawing cannula extending between said two positions which also extends percutaneously and in communicating relation with said arterial passage so that blood flowing from said arterial tube through said arterial passage will flow through said blood withdrawing cannula and said bypass conduit, and

means in said elastomeric body extending from a position exterior of said body inwardly thereof to a position in communicating relation with said venous passage movable between (1) a closed condition excluding fluid containing space within said body between the associated two positions of extent thereof so that blood flowing from said bypass conduit will pass therefrom into said venous passage and out of said venous tube, and (2) an open condition excluding fluid receiving space within said body from the exterior periphery of the portion of a blood returning cannula extending between the associated two positions of extent thereof which blood returning cannula also extends percutaneously and in communicating relation with the venous passage so that said venous passage will receive blood flowing both from said blood returning cannula and said bypass conduit.

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**4,479,799**

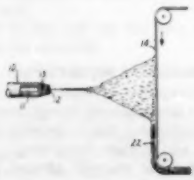
## HYPODERMIC SYRINGE CONTAINING MICROFIBERS OF AN AMORPHOUS HEPARIN SALT

**Charles G. Thiel, St. Paul, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.**

**Division of Ser. No. 267,579, May 21, 1981, Pat. No. 4,405,612, Continuation-in-part of Ser. No. 152,751, May 23, 1980, abandoned. This application Apr. 6, 1983, Ser. No. 482,593**

**Int. Cl.³ A61M 5/00**

**U.S. Cl. 604—187** **9 Claims**



1. A hypodermic syringe containing a quantized amount of microfibers of an amorphous heparin salt which have an average length to diameter ratio of at least 20.

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**4,479,800**

## INJECTING NEEDLE WITH INCLINOMETER

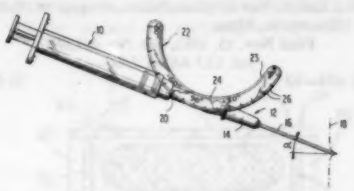
**Martin H. Chester, 25310 Tierra Grande Dr., Carmel, Calif. 93923**

**Filed Apr. 29, 1983, Ser. No. 489,975**

**Int. Cl.³ A61M 5/32**

**U.S. Cl. 604—187** **9 Claims**

1. In an injection needle and syringe assembly having a syringe and an injection needle coupled to the syringe, the improvement comprising gravity-responsive inclinometer



means mounted on the assembly for indicating the angle of inclination of the needle relative to a patient's skin.

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**4,479,801**

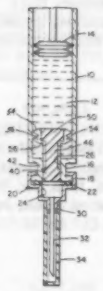
## FLUID DISPENSING DEVICE

**Milton J. Cohen, 10823 Burbank Dr., Potomac, Md. 20854**

**Division of Ser. No. 392,020, Jun. 25, 1982,. This application Nov. 14, 1983, Ser. No. 550,770**

**Int. Cl.³ A61M 5/00**

**U.S. Cl. 604—238** **4 Claims**



1. A device for dispensing a fluid maintained in sealed relation therein comprising an elongate barrel having an open end and a cylindrical bore of lesser cross section in the end portion of the barrel leading to the open end, a hollow needle, a hub member secured at one end about the open end of the barrel and at the other end for mounting one end of the hollow needle, and a portion intermediate said end defining a chamber having a cross section greater than the cross section of the bore and in direct communication therewith, a plunger dimensioned slidably to engage the interior of the barrel in sealing relation, a sealing disc within said bore dimensioned to engage the walls of said bore in sealing relation and axially slidable in said bore between a sealing position to seal off the space between said sealing disc and plunger and unsealing position to permit flow of fluid from the barrel to the chamber and to the hollow needle in communication therewith and means for displacement of the plunger within the barrel, wherein the sealing disc includes at least one passage extending crosswise through an intermediate portion of the sealing disc and at least one passage extending downwardly from the upper surface of the sealing disc into communication with said crosswise extending passage whereby communication is established through said passages between the interior of the barrel and the chamber when the sealing disc is displaced from the bore by an amount to enable the crosswise passages to clear the open end of the barrel.

4,479,802

## IRRIGATING VECTIS

Aziz Y. Anis, 7531 N. Hampton, Lincoln, Nebr. 68506

Filed Feb. 16, 1983, Ser. No. 467,033
Int. Cl.³ A61M 5/00
U.S. Cl. 604—275 1 Claim

1. An irrigating vectis, comprising,

an elongated shank portion having means on one end thereof for connection to an irrigating syringe,

and an irrigating loop portion at the other end of said shank portion, said loop portion having an inwardly indented portion at the end thereof,

said irrigating loop portion having irrigating apertures formed therein to enable irrigation fluid to be discharged outwardly therefrom,

said loop portion comprising first and second loop members which extend from said shank portion in a diverging relationship, and an end portion extending between said first and second loop portions, said end portion having

bulged portions at its end, said indented portions being positioned between said bulged portions.

4,479,803

## AGENT FOR OXIDATIVE DYEING OF HAIR

Heinrich Bachmann, Giffers, and Plato Portmann, Fribourg, both of Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP80/00103, § 371 Date Apr. 8, 1981, § 102(e) Date Apr. 8, 1981, PCT Pub. No. WO81/00810, PCT Pub. Date Apr. 2, 1981

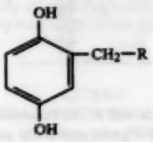
PCT Filed Sep. 25, 1980, Ser. No. 253,510

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939303

Int. Cl.³ A61K 7/13

U.S. Cl. 8—406 5 Claims

1. Aqueous composition for the oxidative dyeing of human hair, containing 0.1 to 6.0 percent by weight of a compound of the formula (I)



(I)

wherein R signifies COOR', $CONH_2$, CONHR', CONR'$_2$ or CONH—OH, with R' being an alkyl group with 1 to 5 carbon atoms.

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4,479,804

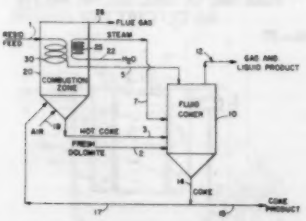
## FIXED SULFUR PETROLEUM COKE FUEL AND METHOD FOR ITS PRODUCTION

Nai Y. Chen, R.D. Titusville, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 127,667, Mar. 6, 1980, Pat. No. 4,305,809. This application Sep. 11, 1981, Ser. No. 301,356

Int. Cl.³ C10L 7/00; C10G 9/14, 9/28

U.S. Cl. 44—1 SR 6 Claims




1. A fixed-sulfur petroleum coke fuel produced by coking in a coking zone a heavy petroluem coker feedstock in the presence of an added alkaline earth metal oxide or precursor thereof, the amount of added alkaline earth metal oxide being within the range from about 1 to 10 times the amount theoretically necessary to completely fix the sulfur contained in the coke produced from the petroluem coker feedstock, and recovering coker products including fixed-sulfur petroleum coke fuel comprising coke deposited on particles of said alkaline earth additive, said fuel containing about 3 to 30 weight percent ash (calculated as calcium oxide) derived from the alkaline earth additive.

4,479,805

## TREATING-HIGH ASPHALTENE FUEL OILS

Sushil K. Batra, Shrewsberry, Mass., assignor to Columbia Chase Corporation, Braintree, Mass.

Filed Sep. 12, 1983, Ser. No. 531,257

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 16 Claims

1. A process for the treatment of asphaltene-bearing heavy fuel oils to reduce acid-smut in stackgas resulting from burning said fuels comprising the steps of processing said heavy fuel oil under pressure, through a restricted liquid shearing apparatus with the addition of controlled amounts of water, and simultaneously reducing asphaltene particle size such that a majority of resulting asphaltene particles are below 2 microns in diameter with substantially all said asphaltene particles less than 7 microns in diameter and dispersing said particles uniformly throughout said fuel oil.

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4,479,806

## STABILIZED SLURRY AND PROCESS FOR PREPARING SAME

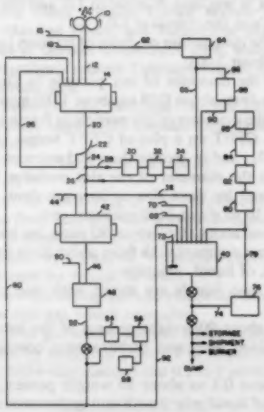
James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred Station, N.Y.

Continuation-in-part of Ser. No. 474,125, Mar. 10, 1983, , which is a continuation-in-part of Ser. No. 375,183, May 5, 1982, Pat. No. 4,441,887, which is a continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, Pat. No. 4,416,666, which is a continuation-in-part of Ser. No. 088,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Sep. 16, 1983, Ser. No. 532,909

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 13 Claims



1. A process for preparing a carbonaceous slurry which is comprised of at least about 60 volume percent of solid carbonaceous material and which has a Brookfield viscosity at a solids content of 70 volume percent, ambient temperature, and ambient pressure, of less than 5,000 centipoise, comprising the steps of:

(a) providing a carbonaceous compact, wherein:

1. said compact has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than about 20 volume percent,
2. said compact comprises finely divided solid carbonaceous particles,
3. from about 5 to about 70 weight percent of said solid

carbonaceous particles are of colloidal size, being smaller than about 3.0 microns,

4. at least about 85 weight percent of said solid carbonaceous particles in the compact have a particle size less than about 300 microns, and

5. said compact of finely divided solid carbonaceous particles has a particle size distribution substantially in accordance with the following formula:

$$\frac{CPFT}{100} = \sum_{j=1}^{k}\left[X_j\left(\frac{D^{Nj} - D_s^{Nj}}{D_{Lj}^{Nj} - D_s^{Nj}}\right)\right]$$

where $\sum_{j=1}^{k} X_j = 1.0$

and where if $D < D_{sj}$ $\left(\frac{D^{Nj} - D_s^{Nj}}{D_{Lj}^{Nj} - D_s^{Nj}}\right) = 0.0$

and where if $D > D_{Lj}$ $\left(\frac{D^{Nj} - D_s^{Nj}}{D_{Lj}^{Nj} - D_s^{Nj}}\right) = 1.0$

wherein:

(a) CPFT is the cumulative percent of said solid carbonaceous material finer than a certain specified particle size D, in volume percent;

(b) k is the number of component distributions in the consist and is at least 1;

(c) $X_j$ is the fractional amount of the component j in the consist, is less than or equal to 1.0, and the sum of all of the $X_j$'s in the consist is 1.0;

(d) n is the distribution modulus of fraction j and is greater than about 0.001;

(e) D is the diameter of any particle in the consist and ranges from about 0.05 to about 1180 microns;

(f) $D_s$ is the diameter of the particle in fraction j, measured at 1% CPFT on a plot of CPFT versus size D, is less than $D_L$, and is greater than 0.05 microns;

(g) $D_L$ is the diameter of the size modulus in fraction j, measured by sieve size or its equivalent, and is from about 10 to about 1180 microns; and

(b) mixing from about 60 to about 80 parts, by volume, of said carbonaceous compact with from about 20 to about 40 parts, by volume, of liquid, wherein:

1. at least two liquids are mixed with said carbonaceous compact,

2. at least about 90 weight percent of the total amount of liquid mixed with said carbonaceous compact is water, and

3. from about 0.1 to about 10 weight percent of the total amount of liquid mixed with said carbonaceous compact is non-aqueous liquid.

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**4,479,807**

## GASOLINE-SUBSTITUTE FUEL

**Ralph A. Rebandt, Woodhaven, Mich.**

**Continuation of Ser. No. 223,814, Jan. 9, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 472,939**

**Int. Cl.³ C10L 1/18, 1/30**

**U.S. Cl. 44—56** **8 Claims**

1. A gasoline-substitute fuel consisting exclusively of 5–15% by volume of a monohydroxy alcohol containing 1–4 carbon atoms per molecule, 2–10% by volume of a conventional diesel fuel, and the balance by volume consisting of a conventional gasoline.

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**4,479,808**

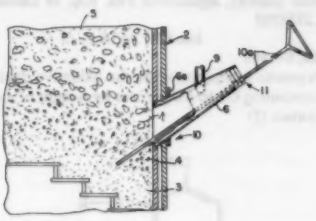
## POKEHOLE SYSTEM FOR FIXED BED GASIFIER AND POKEHOLE UNIT

**Hugh L. Campbell, Drums, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.**

**Filed Aug. 8, 1983, Ser. No. 521,004**

**Int. Cl.³ C10J 3/20**

**U.S. Cl. 48—76** **7 Claims**



1. A pokehole unit for use in the reduction zone between a fire zone located above a grate and a top zone of reserve fuel in a vertical fixed bed gasifier through which a poker may be inserted for poking the fire in the gasifier comprising a tubular extension, projecting radially from an opening in the wall of the gasifier located at said reduction zone, having a closure at its outer end with an opening through which a poker may be removably inserted, a cover with a pokehole therethrough movable into and out of position over said opening, means defining a source of air under pressure and a valve and an associated conduit connected for introducing said air into the tubular extension when the cover is open and an operating linkage between the cover and the valve arranged to open the valve from the air source into the tubular extension when the cover is opened, and shut off the air from said source to the interior of the tubular extension when the cover is moved into position to close the opening.

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**4,479,809**

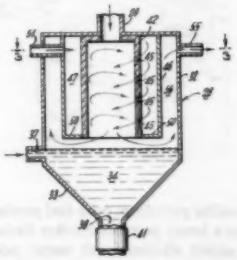
## APPARATUS FOR GASIFYING COAL INCLUDING A SLAG TRAP

**Everett M. Johnson, Fishkill, N.Y., and Warren G. Schlinger, Pasadena, Calif., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Dec. 13, 1982, Ser. No. 449,110**

**Int. Cl.³ C10J 3/08**

**U.S. Cl. 48—77** **4 Claims**



1. In combination with a high pressure coal gasifier where small particulate slag is generated, a slag trap comprising

a high pressure vessel having an inlet at the top for receiving synthesis gas containing small particulate slag entrained therewith,

said vessel comprising

a shell for containing said high pressure,

means for maintaining a body of water at the bottom of said shell underneath said inlet,

first coaxial wall means for confining said synthesis gas and entrained slag to downward flow toward said body of water, comprising a plurality of passages therethrough for directing swirling flow therein,

means for recirculating some of said synthesis gas through said plurality of passages, comprising a second coaxial wall between said shell and said first coaxial wall means,

annular means for closing the space between said first coaxial wall means and said second coaxial wall means,

an inlet to said space for introducing said recirculated synthesis gas comprising a plurality of tangentially directed conduits, and

an outlet for said synthesis gas spaced substantially above the bottom of said first and second coaxial wall means to cause reversal of said synthesis gas and entrained slag flow above said body of water whereby said slag is quenched and retained by said water while the synthesis gas flows to said outlet.

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## 4,479,810
## PARTIAL OXIDATION SYSTEM

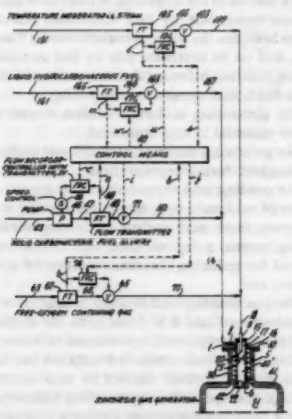
**Charles P. Marion, Mamaroneck; William B. Crouch, Chappaqua; Albert Brent, Huntington, all of N.Y.; George N. Richter, San Marino, Calif.; Edward T. Child, Tarrytown, N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.**

**Division of Ser. No. 272,419, Jun. 10, 1981, Pat. No. 4,400,180, which is a continuation-in-part of Ser. No. 212,054, Dec. 3, 1980, Pat. No. 4,371,378, which is a continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, Pat. No. 4,351,645, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Sep. 24, 1982, Ser. No. 422,939**

**The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.**

**Int. Cl.³ C10J *3/50***

**U.S. Cl. 48—86 R** **6 Claims**



1. A system for controlling the introduction of a plurality of reactant streams into the reaction zone of a partial oxidation gas generator comprising: a burner comprising a central conduit means radially spaced from a concentric coaxial outer conduit means having a downstream exit nozzle and providing a coaxial annular passage means therebetween and wherein said burner comprising said central conduit means is coaxial with the central longitudinal axis of said burner and has a downstream exit orifice that discharges into a pre-mix zone, said central conduit means providing a passage, said outer coaxial conduit providing said annular passage means along the length of said central conduit means between the inside diameter of said outer conduit and the outside diameter of said central conduit means, an exit nozzle coaxial with and terminating said outer conduit at the downstream end of said burner, comprising a converging frusto-conical rear portion and a right cylindrical front portion, an annular shaped face-cooling chamber surrounding said exit nozzle at the burner tip, and wherein the tip of said central conduit means is retracted upstream from the face of said burner a distance of two or more times the minimum diameter of said outer conduit converging exit nozzle to provide a pre-mix zone comprising one or more cylindrically shaped communicating pre-mix chambers in tandem and coaxial with the central longitudinal axis of said burner; separate burner inlet lines connected by separate inlet means respectively to said central conduit means and to said annular passage means; conduit means including four feed lines connecting four different material feedstreams to said burner inlet lines for introducing said feedstreams into the burner, said burner discharging said feedstreams or mixtures thereof into said reaction zone; and a separate flow rate sensing means and a separate flow rate controller in each of said feed lines for independently sensing the flow rate for each material flowing through a particular feed line and providing a signal corresponding to the actual flow rate for that feedstream to a control means operatively connected thereto for comparing each actual flow rate signal with a manual or automatically computed and inserted input signal representing the desired flow rate or set point at that moment for each feedstream and providing a corresponding adjustment signal for separately operating the flow rate controller in that particular feed line, and thereby independently controlling the flow rate for each feedstream entering the burner at that moment.

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## 4,479,811
## METHOD FOR THE DRYING AND REMOVAL OF HYDROCARBONS FROM GASES

**Burkhard Schlicht; Christel Sonntag; Hans Beise; Otto Lindner, all of Berlin; Klaus Wehner, Leuna; Werner Burk, Halle-Neustadt; Manfred Gross, and Hans-Peter Minak, both of Freiberg, all of German Democratic Rep., assignors to VEB Chemieanlagenbaukombinat Leipzig-Grimma, Grimma, German Democratic Rep.**

**Filed Feb. 28, 1983, Ser. No. 469,832**

**Claims priority, application German Democratic Rep., Jan. 19, 1982, 2368474**

**Int. Cl.³ B01D *53/28***

**U.S. Cl. 55—32** **18 Claims**

1. A solvent for the drying of gas and removal of aromatic hydrocarbons from said gas, said solvent comprising

79.9 to 97 percent by weight of glycol,

2 to 20 percent by weight of N-methyl-ε-caprolactam, and

0.1 to 1 percent by weight of water.

10. A process for drying gas and removing aromatic hydrocarbons from said gas which comprises

contacting said gas with a solvent which comprises 79.9 to 97 percent by weight of glycol, 2 to 20 percent by weight of N-methyl-ε-caprolactam and 0.1 to 1 percent by weight of water.

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## 4,479,812
## SORPTION FRACTIONATION SYSTEM FOR OLEFIN SEPARATION

**Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

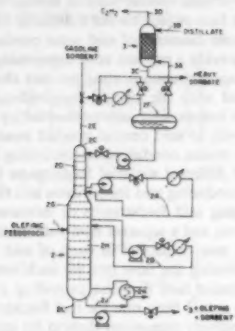
**Filed Jun. 29, 1983, Ser. No. 508,779**

**Int. Cl.³ B01D *47/12, 3/16***

**U.S. Cl. 55—48** **5 Claims**

1. A continuous fractionation process for recovering ethylene from an olefinic feedstock comprising about 10 to 50 mole % ethylene and 10 to 50 mole % propene, said olefinic feedstock consisting essentially of volatile $C_2$–$C_4$ hydrocarbons comprising the steps of

contacting the olefinic feedstock in a countercurrent sorption tower with a liquid sorbent stream comprising $C_6^+$ olefinic gasoline range hydrocarbons under process conditions to selectively sorb substantially the entire $C_3^+$ olefin components from the feedstock;



withdrawing an ethylene-rich vapor stream from the sorption tower; and

further contacting the ethylene-rich stream with a distillate range liquid hydrocarbon stream in a sponge absorber to recover ethylene having an average molecular weight not greater than 28.5.

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**4,479,813**

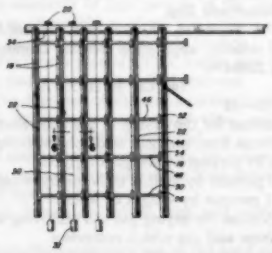
**ELECTROSTATIC PRECIPATATOR CONSTRUCTION HAVING LADDER BAR SPACERS**

**John A. Jonelis, 304 Lancaster Dr., Crystal Lake, Ill. 60015**

**Filed Nov. 29, 1982, Ser. No. 445,260**

**Int. Cl.³ B03C *3/08, 3/47***

**U.S. Cl. 55—137** **8 Claims**



1. In an electrostatic precipitator for collecting solid particles carried by a flue gas from a source of combustion, said precipitator including a plurality of parallel precipitator plates spaced from and adjacent one another for collecting solid particles by electrostatic attraction of solid particles to the plates, and a second plurality of elongated electrodes mounted between adjacent plates substantially parallel to each other and substantially parallel to the plates, each of said elongated electrodes being substantially equidistantly spaced from adjacent electrodes, the improvement comprising: a third plurality of ladder bars positioned between adjacent plates to hold adjacent surfaces of adjacent plates in an equidistantly spaced relationship, each of said ladder bars having a connector bar secured to one of a pair of the adjacent surfaces, each of said connector bars having a circular cross section, and each of said ladder bars having a fourth plurality of holder bars, each of said holder bars having a circular cross section, each of the holder bars having one end connected to its respective connector bar and extending outward from the connector bar toward the other of the pair of adjacent surfaces.

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**4,479,814**

**RECIRCULATION REGENERATION**

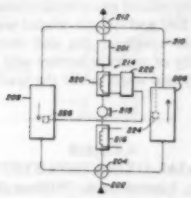
**Michael D. Oliker, Amesbury, Mass., assignor to Near Equilibrium Research Associates, Amesbury, Mass.**

**Continuation-in-part of Ser. No. 361,134, Mar. 24, 1982, , which is a division of Ser. No. 166,054, Jul. 7, 1980, Pat. No. 4,324,564.**

**This application Apr. 12, 1983, Ser. No. 484,176**

**Int. Cl.³ B01D *53/04***

**U.S. Cl. 55—162** **36 Claims**



1. A system of improved operational efficiency for cyclically treating a fluid feed stream in a sorption bed to reduce the concentration of a sorbate carried in said stream during a sorption stage and thermally regenerating said sorption bed by circulating a regeneration stream during a regeneration stage, said system comprising a main sorption bed comprising a housing defining a fluid feed flow path along a mass of sorbent material contained therein for treating fluid feed during said sorption stage, and a regeneration apparatus for circulating said regeneration stream through said main bed countercurrent to the direction of said fluid feed stream during said regeneration stage, wherein, in operation during said regeneration stage, during an interval when a hot regenerant fluid passes through said main sorption bed, there is created therein a RW front which moves in the direction of fluid flow and is bounded on its downstream side by bed conditions characteristic of equilibrium between the sorbent material and a fluid waste rich in sorbate, and on its upstream side by bed conditions characteristic of equilibrum between the sorbent material and the hot regenerant fluid, said apparatus comprising

means for circulating said regeneration stream through the sorbent material in said main bed;

means for removing sorbate from effluent exiting said main sorption bed during regeneration;

means for cooling said regeneration stream;

upstream of said main bed, means for heating said effluent;

downstream from said sorbate removing means and said cooling means, a regeneration bed containing a sorbent material for reducing the concentration of sorbate in said effluent; and

means for inactivating said heating means prior to the time the midpoint of said RW front exits the sorption bed.

26. A system of improved operational efficiency for cyclically treating a fluid feed stream in a sorption bed to reduce the concentration of a sorbate carried in said stream during a sorption stage and thermally regenerating said sorption bed by circulating a regeneration stream during a regeneration stage, said system comprising a main sorption bed comprising a housing defining a fluid feed flow path along a mass of sorbent material contained therein for treating fluid feed during said sorption stage, and a regeneration apparatus for circulating said regeneration stream through said main bed countercurrent to the direction of said fluid feed stream during said regeneration stage, wherein said apparatus comprises:

means for circulating said regeneration stream through the sorbent material in said main bed;

means for removing sorbate from effluent exiting said main sorption bed during regeneration;

means for cooling said regeneration stream;

downstream from said sorbate removing means and said cooling means, a regeneration bed containing a sorbent material for reducing the concentration of sorbate in said effluent;

upstream of said main bed and said regeneration bed, means for heating said effluent; and

means for circulating a portion of the output of said means for heating around said regeneration bed.

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**4,479,815**

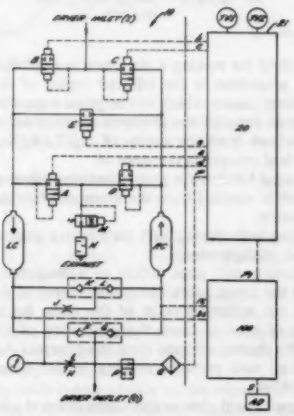
## PNEUMATIC CONTROLLER AND ALARM FOR ADSORBENT FRACTIONATERS, PARTICULARLY DESSICANT DRYERS

**Craig S. Tinker, and Thomas G. Haberer, both of Ocala, Fla., assignors to Pall Corporation, Glen Cove, N.Y.**

**Filed Mar. 9, 1983, Ser. No. 473,855**

**Int. Cl.³ B01D *53/04***

**U.S. Cl. 55—163** **8 Claims**



1. A controller for an adsorbent fractionater having two adsorbent beds which are alternately switched between an on stream condition in which a bed is processing the product stream and an off stream condition in which a bed is first regenerated and then repressurized prior to being switched to the on stream condition, the alternate switching of the beds being effected by a flow valve system comprising inlet valves for selectively admitting gas to be processed into the adsorbent beds and exhaust valves for selectively releasing regeneration gas from the beds, the flow valves being controlled by pneumatic pilot signals, the controller comprising:

a source of pressurized gas;

first control valve means for selectively supplying pilot signals from the source to the inlet flow valves;

second control valve means for selectively supplying pilot signals from the source to the exhaust flow valves;

a pressure regulator for selectively reducing the pressure of the source gas to a lower, regulated pressure;

first and second pneumatic accumulators;

third control valve means to control the first and second control valve means to generate a schedule of pilot signals at the pressure of the gas source, the third control valve means comprising first and second variable orifices, the schedule of pneumatic pilot signals being based on the time intervals required to raise the pressures in the pneumatic accumulators from respective starting pressure levels to within respective predetermined pressure differentials relative to said regulated pressure, the time intervals being selectively variable through independent adjustment of the orifice sizes and the regulated pressure output of the pressure regulator, the pressure level of the pilot signals being unaffected by variations in the output of said pressure regulator.

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**4,479,816**

## APPARATUS FOR SCRUBBING GASES

**Walter Ganter, Pullach, Fed. Rep. of Germany, assignor to Theisen GmbH, Munich, Fed. Rep. of Germany**

**Filed Sep. 29, 1982, Ser. No. 427,563**

**Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220328**

**Int. Cl.³ B01D *47/00***

**U.S. Cl. 55—230** **1 Claim**

1. An apparatus for scrubbing gases, comprising an approximately flat cylindrical or flat spiral-shaped fan casing, at least one gas suction duct for gas to be purified opening centrally into said casing, a gas discharge duct leading away from the periphery of said casing, a rotor shaft supported coaxially with the axis of the fan casing, at least one supporting disc fixed on the rotor shaft in a direction normal to the axis, a rotor bar cage fixed on the supporting disc and consisting of eight to ten concentric rotor rings of bars at uniform spacings and each having bars drop-shaped in cross section extending parallel to the axis and being approximately twice as long in circumferential direction as in radial direction, as seen in cross section, each bar being disposed at an angle of from 16° to 22° with respect to the circumferential direction, a stator bar cage completely extending into the rotor bar cage, being fixed to the fan casing, and consisting of a plurality of concentric rings of bars at uniform spacings and projecting between two rings of bars each of the rotor bar cage, the bars thereof having a drop-shaped cross section and extending parallel to the axis and being approximately twice as long in circumferential direction than in radial direction, as seen in cross section, each bar being disposed at an angle of from 16° to 22° with respect to the circumferential direction and in a direction opposed to the bars of the rotor bar cage, the same spacing between all rings of bars amounting to from 25% to 30% of the diameter of the innermost ring of bars, and means for introducing cleaning liquid into said casing.

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**4,479,817**

## PRESSURIZED HOT CYCLONE

**Andrew B. Steever, Old Greenwich, and Albert Vitin, Stamford, both of Conn., assignors to Dorr-Oliver, Inc., Stamford, Conn.**

**Filed Apr. 3, 1980, Ser. No. 136,792**

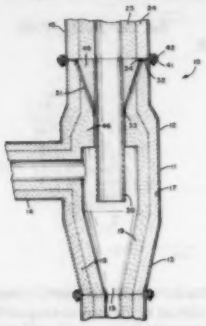
**Int. Cl.³ B01D *53/24***

**U.S. Cl. 55—267** **5 Claims**

1. A cyclone for high temperature pressurized applications comprising a metal pressure vessel having a generally cylindrical upper portion joined to an essentially conical lower portion, a tangential inlet conduit opening into the cylindrical portion of said vessel, an outlet for separated material at the apex of said conical portion of said vessel, a metal vortex finder of cylindrical configuration supported within said vessel by a generally conical thermal sleeve, said sleeve being welded at the upper end thereof to a ring member which is fixed relative to said pressure vessel at the upper end of said cylindrical portion and an exhaust conduit positioned to receive gases exiting upward through said vortex finder.

4. A cyclone for high temperature pressurized applications

comprising a metal pressure vessel lined with refractory insulation and having a generally cylindrical upper portion joined to an essentially conical lower portion, a tangential inlet conduit opening into the cylindrical portion of said vessel, an outlet for separated material at the apex of said conical portion of said vessel, a metal vortex finder of cylindrical configuration supported within said vessel by a generally conical thermal sleeve, refractory insulation filling the region between the inner conical surface of the thermal sleeve and said vortex finder, said



refractory insulation lining of said pressure vessel being in contact with the conical outer surface of said thermal sleeve, said thermal sleeve being welded at the upper end thereof to a ring member which is fixed relative to said pressure vessel at the upper end of said cylindrical portion, said conical thermal sleeve providing a relatively long heat transfer path of low thermal gradient between said vortex finder and said ring member, and an exhaust conduit positioned to receive gases exiting upward through said vortex finder.

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**4,479,818**

## SURGICAL DRAINAGE BAGS

**Peter J. Briggs, Sompting, and Kenneth J. Brooks, Lancing, both of England, assignors to Matburn (Holdings) Limited, London, England**

**Filed May 6, 1982, Ser. No. 375,652**

**Claims priority, application United Kingdom, May 7, 1981, 8113942; Sep. 14, 1981, 8127699**

**Int. Cl.³ B01D *50/00***

**U.S. Cl. 55—385 C** **8 Claims**

**8. A filter system with a bag with a vent opening comprising a first mount which is secured to a wall of the bag, and is provided with a through opening in registration with said vent opening of said bag, and a second mount having a tubular vent plug removably received in the opening in said first mount and in sliding engagement therewith, a recess in said second mount communicating with the vent in said plug, an outlet opening in said second mount, and at least a filter element which removes odors received in said recess and positioned between said vent plug and said outlet opening.**

**4,479,819**

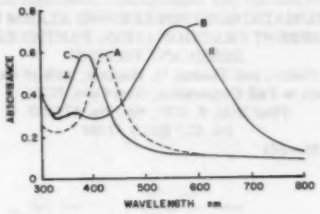
## INFRARED POLARIZING GLASSES

**Nicholas F. Borelli, Elmira; Frank Coppola, Horseheads; David L. Morse, Corning; Daniel A. Nolan, Corning, and Thomas P. Seward, III, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Sep. 29, 1982, Ser. No. 427,732**

**Int. Cl.³ C03C *3/26, 23/00*; C03B *19/00***

**U.S. Cl. 65—30.11** **10 Claims**




**1. A method for making a glass article exhibiting excellent polarizing properties in the infrared region of the radiation spectrum from glasses which will be phase separable or will be photochromic through the presence of silver halide particles therein selected from the group of AgCl, AgBr, and AgI, which method comprises the steps of:**

**(a) melting a batch for a glass containing silver and at least one halide selected from the group of chloride, bromide, and iodide;**

**(b) cooling and shaping said melt into a glass article of a desired configuration;**

**(c) subjecting said glass article to a temperature at least above the strain point, but not in excess of about 50° C. above the softening point of the glass, for a sufficient length of time to cause the generation of silver halide particles therein selected from the group of AgCl, AgBr, and AgI, said particles ranging in size between about 200–5000Å;**

**(d) elongating said glass article under stress at a temperature above the annealing point, but below that where said glass exhibits a viscosity of about $10^8$ poises, such that said silver halide particles are elongated to an aspect ratio of at least 5:1 and aligned in the direction of the stress; and**

**(e) exposing said elongated glass article to a reducing atmosphere at a temperature above about 250° C., but no higher than about 25° C. above the annealing point of the glass, for a sufficient length of time to develop a reduced surface layer on said glass article having a thickness of at least 10 microns wherein at least a portion of said elongated silver halide particles are reduced to elemental silver particles having aspect ratios greater than 2:1 which are deposited in and/or upon said elongated particles, whereby said glass article exhibiting excellent polarizing properties in the infrared region of the radiation spectrum is formed.**

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**4,479,820**

## USE OF POLYCONDENSATION PRODUCTS FROM ACROLEIN AND FORMALDEHYDE AS BIOCIDE

**Wolfgang Merk, Limeshain, and Karl-Heinz Rink, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Feb. 8, 1983, Ser. No. 464,863**

**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205487**

**Int. Cl.³ C02F *1/50***

**U.S. Cl. 71—67** **15 Claims**

**1. A process of killing microorganisms or algae in an aqueous system comprising treating the aqueous system with a biocidally effective amount of a water soluble polycondensation product produced by condensation of acrolein and formal-**

dehyde in the molar ratio between 1:1 and 1:10 in an aqueous or aqueous-organic medium.

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**4,479,821**

## N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

**Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 282,847, Jul. 13, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,695**

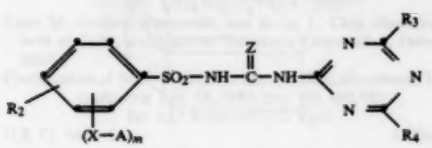
**Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81**

**Int. Cl.³ C07D** *251/46, 251/22, 251/44;* **A01N** *43/66*

**U.S. Cl. 71—93** **28 Claims**

1. A N-phenylsulfonyl-N'-triazinyl-urea of the formula I

(I)



wherein

A is a $C_1$–$C_5$alkyl radical which is substituted by $C_1$–$C_4$alkoxy, $C_1$–$C_4$alkylthio, $C_1$–$C_4$alkylsulfinyl or $C_1$–$C_4$-alkylsulfonyl,

X is oxygen, sulfur, a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

m is 1 or 2,

$R_2$ is hydrogen, halogen, $C_1$–$C_5$alkyl, $C_2$–$C_5$alkenyl, $C_1$–$C_4$-haloalkyl, or a radical —Y—$R_5$, —$COOR_6$, —$NO_2$ or —CO—$NR_7$—$R_8$,

$R_3$ and $R_4$, each independently of the other, are hydrogen, $C_1$–$C_4$alkyl, $C_1$–$C_4$alkoxy, $C_1$–$C_4$alkylthio, $C_1$–$C_4$haloalkyl, halogen or alkoxyalkyl of at most 4 carbon atoms,

$R_5$ and $R_6$, each independently of the other, are $C_1$–$C_5$alkyl, $C_2$–$C_5$alkenyl or $C_2$–$C_6$alkynyl,

$R_7$ and $R_8$, each independently of the other, are hydrogen, $C_1$–$C_5$alkyl, $C_2$–$C_5$alkenyl or $C_2$–$C_6$alkynyl, and

Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

28. A method of suppressing plant growth, which method comprises applying thereto or to the locus thereof an effective amount of a compound according to claim 1.

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**4,479,822**

## SUBSTITUTED CARBANILIC ACID ESTERS AND HERBICIDAL COMPOSITION CONTAINING SAME

**Friedrich Arndt; Heinrich Franke; Erich Schmidt, and Reinhold Puttner, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

**Continuation of Ser. No. 138,577, Apr. 8, 1980, abandoned. This application Aug. 10, 1982, Ser. No. 406,897**

**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913976**

**Int. Cl.³ C07C** *125/065;* **A01N** *37/44*

**U.S. Cl. 71—111** **5 Claims**

1. A selective herbicidal composition comprising at least one carbanilic acid ester selected from the group consisting of 3-chloro-4-(2,2-dichlorocyclopropylmethoxy)-carbanilic acid-methylester, 3-chloro-4-(2,2-dichloro-1-methylcyclopropyl-methoxy)-carbanilic acid-methylester and 3-chloro-4-(2,2-dichloro-1-methycyclopropylmethoxy)-carbanilic acid-benzylester in an amount of 10 to 90 percent by weight and an inert liquid or solid carrier material in amount of 90 to 10 percent by weight.

3. 3-chloro-4-(2,2-dichloro-1-methylcyclopropylmethoxy)-carbanilic acid-methylester.

4. 3-chloro-4-(2,2-dichloro-1-methylcyclopropylmethoxy)-carbanilic acid-benzylester.

5. 3-chloro-4-(2,2-dichlorocyclopropylmethoxy)-carbanilic acid-methylester.

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**4,479,823**

## PROCESS FOR THE PRODUCTION OF SILVER-TIN MASTER ALLOYS FOR DENTAL AMALGAMS

**Wolfgang Hohmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany**

**Filed Oct. 25, 1983, Ser. No. 545,208**

**Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240256**

**Int. Cl.³ B22F** *9/00*

**U.S. Cl. 75—0.5 R** **12 Claims**

1. A process for the production of a master alloy powder with improved properties for producing dental filling material when amalgamated with mercury, comprising the steps of:

(a) atomizing an alloy containing silver, tin and copper into a first spherical powder;

(b) drying and forming said first powder into a coherent shaped article;

(c) sintering the shaped article at an elevated temperature; and

(d) pulverizing the sintered shaped article into a master alloy powder.

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**4,479,824**

## SILICATE BINDERS AND COATINGS

**John B. Schutt, 2403 Peach Stone Ct., Silver Spring, Md. 20904**

**Filed May 4, 1983, Ser. No. 492,812**

**Int. Cl.³ C09D** *5/10*

**U.S. Cl. 106—14.21** **15 Claims**

1. An inorganic alkali metal silicate binder composition, in the form of a mixed silicon dioxide silica gel sol, comprising an alkali metal silicate, a silicone, silica gel, and water, said composition having a silicon dioxide to alkali metal oxide mol ratio of about 5.5–6.5:1 , the composition being formed by adding the silicone to the alkali metal silicate contained in aqueous solution and then adding the silica gel with agitation, wherein the silica gel added becomes fully hydrated by the fluxing action during reaction and utilizes the silicone molecules to maintain the gel particles in suspension while freeing the alkali metals ions to promote hydration of additional gel particles; said composition having good brushability when applied as a binder for a paint composition.

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**4,479,825**

## GELLED NONPIGMENTED WOOD STAINS

**Julio A. Fernandez, Ontario, Canada, assignor to National Starch and Chemical Corp., Bridgewater, N.J.**

**Filed May 13, 1983, Ser. No. 494,238**

**The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.**

**Int. Cl.³ C09K** *3/00*

**U.S. Cl. 106—34** **5 Claims**

1. A gelled nonpigmented wood stain composition comprising:

(a) from 0.3 to 10% by weight of at least one soluble aniline dye;

(b) from 0.5 to 6% of dibenzylidene sorbitol; and

(c) the remainder of the composition comprising a suitable solvent selected from the group consisting of cyclohexanol, methyl benzyl alcohol, beta-phenethyl alcohol and n-methylcyclohexanol.

4,479,826

## CONDENSATION PRODUCTS OF SUBSTITUTED PHENOL SULFONIC ACID AND FORMALDEHYDE

John G. Papalos, Ledgewood, and Arpad Savoly, Martinsville, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Division of Ser. No. 396,698, Jul. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 294,337, Aug. 19, 1981, abandoned. This application Mar. 23, 1984, Ser. No. 592,855

Int. Cl.³ C04B 7/35

U.S. Cl. 106—90 22 Claims

1. A process for producing a slurry selected from the group consisting of

(a) cement and water;

(b) cement and brine;

(c) cement, gravel, sand and water; and

(d) cement, gravel, sand and brine comprising admixing with the slurry, an effective amount of a condensation product and salt thereof selected from the group consisting of

(a) condensation product of a substituted phenol sulfonic acid selected from the group consisting of an arylphenol sulfonic acid and an aralkylphenol sulfonic acid with from about 0.5 to about 4 moles of formaldehyde per mole of substituted phenol sulfonic acid, and

(b) condensation product of (i) a substituted phenol sulfonic acid selected from the group consisting of an arylphenol sulfonic acid and an aralkylphenol sulfonic acid and (ii) an aryl sulfonic acid with from about 0.5 to about 4 moles of formaldehyde per mole of substituted phenol sulfonic acid and aryl sulfonic acid wherein weight ratio of substituted phenol sulfonic acid to aryl sulfonic acid is from about 0.95:0.05 to about 0.05:0.95

to obtain a slurry having reduced viscosity.

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4,479,827

## ASPHALT COMPOSITIONS

Arthur T. Ward, 4 Blythewood Rd., Baltimore, Md. 21210

Continuation-in-part of Ser. No. 205,151, Nov. 10, 1980, Pat. No. 4,373,960. This application Sep. 30, 1982, Ser. No. 432,405

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ C08L 95/00

U.S. Cl. 106—281 R 20 Claims

1. A non-emulsified asphalt binder composition comprising: (1) a medium curing liquid asphalt; and (2) from about 0.1 to 13.5% tall oil based on the weight of medium curing asphalt, with the binder composition containing essentially no water.

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4,479,828

## LIGHT COLORED AND LOW DENSITY MINERAL FILLER FROM MAGNESIUM SILICATE

Jean M. Lalancette, Sherbrooke, and Hugues Hamelin, Saint-Léonard, both of Canada, assignors to Societe Nationale de L'Amiante, Quebec, Canada

Filed Oct. 18, 1983, Ser. No. 543,002

Int. Cl.³ C09C 1/36

U.S. Cl. 106—308 B 4 Claims

1. A light coloured and asbestos free granular material obtained from asbestos tailings wherein the $MgO:SiO_2$ ratio is at least 1.0, said granular material comprising particles consisting of a mixture of enstatite, forsterite and silica having a particle size of from −400 to −10 mesh, said particles being coated with a silicate bonded layer of calcium oxide or magnesium oxide or mixtures thereof, said particles being further characterized by having a bulk density of from 17 to 25 $lb/ft^3$ and having a degree of whiteness within the range of from 50 to 60 when measured by the ASTM Procedure No. E-97-77.

4,479,829

## METHOD FOR MAKING HIGH RESISTANCE CHROMIUM-FREE SEMICONDUCTOR SUBSTRATE BODY WITH LOW RESISTANCE ACTIVE SEMICONDUCTOR LAYER BY SURFACE IRRADIATION

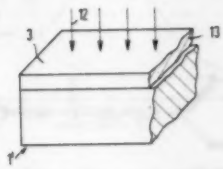
Hermann Kniepkamp, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,237

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044723

Int. Cl.³ H01L 21/268, 21/263, 21/26, 21/324

U.S. Cl. 148—1.5 5 Claims




1. A method for producing a high-resistant substrate body with a low-resistant active semiconductor layer consisting of the same semiconductor material as said substrate body comprising the steps of:

bombarding a gallium arsenide substrate body with thermal neutrons until said substrate body achieves high resistance;

irradiating a surface of said substrate with laser or electron radiation for annealing said substrate, said substrate having doping atoms generated by means of neutron transmutation as a result of said bombarding and irradiating for generating said low resistant active semiconductor layer at said surface having a predetermined depth; and

maintaining said substrate body free of chromium atoms at all times.

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4,479,830

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE USING EPITAXIALLY REGROWN PROTRUSION AS AN ALIGNMENT MARKER

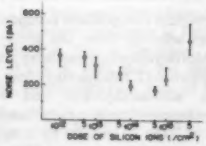
Yutaka Koshino, Yokosuka; Jiro Ohshima, Yokohama; Takashi Ajima, Kamakura, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 31, 1983, Ser. No. 462,201

Claims priority, application Japan, Feb. 1, 1982, 57-14671

Int. Cl.³ H01L 21/265

U.S. Cl. 148—1.5 5 Claims




1. In a method of manufacturing a semiconductor device which includes a step for ion-implanting an impurity into an

impurity-region formation region of a silicon substrate, the method comprising:

(1) ion-implanting silicon ions in a dose of $1\times10^{13}$ to $1\times10^{15}/cm^2$ into the impurity-region formation region immediately before or immediately after said ion implantation step,

(2) subjecting the implanted silicon ions to an activation treatment to form an epitaxially grown protrusion on the surface of the substrate, and

(3) using said protrusion as an alignment mark.

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**4,479,831**

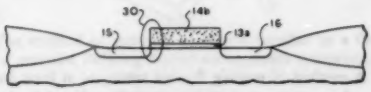
## METHOD OF MAKING LOW RESISTANCE POLYSILICON GATE TRANSISTORS AND LOW RESISTANCE INTERCONNECTIONS THEREFOR VIA GAS DEPOSITED IN-SITU DOPED AMORPHOUS LAYER AND HEAT-TREATMENT

**Peter M. Sandow, Sunnyvale, and Barry L. Chin, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.**

**Continuation of Ser. No. 186,977, Sep. 15, 1980, abandoned. This application Jun. 15, 1983, Ser. No. 493,769**

**Int. Cl.³ H01L *21/263, 7/54***

**U.S. Cl. 148—1.5** **8 Claims**




1. A method of fabricating a plurality of transistors across essentially the entire surface of a crystalline wafer; said transistors being of the type that have source and drain regions in said wafer with low resistance gates and low resistance interconnections lying thereabove; said method including the steps of:

forming an insulating layer across the surface of said wafer with a thickness that is suitable for separating said transistor gates from said wafer;

exposing said insulating layer to a gas mixture of silicon and dopant atoms to deposit thereon an unpatterned layer of in-situ doped silicon, with said silicon layer being deposited in an amorphous state to improve the layer's uniformity in thickness and smoothness across the entire surface;

patterning said silicon layer to the shape of said transistor gates and said interconnections therefor while said silicon is in said amorphous state to improve the accuracy with which the gates and interconnections are defined by removing selected portions thereof;

implanting said source and drain regions of said wafer with dopant atoms; and

heating said implanted source and drain regions to repair any crystal damage caused by said implant while simultaneously heating said patterned amorphous layer of silicon to change it to a patterned polycrystalline layer and thereby decrease the electrical resistivity of said gates and interconnections to about $10^{-3}$ Ω-cm.

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**4,479,832**

## METHOD OF PRODUCING LIGHT ABSORPTIVE SURFACE ON ALUMINUM ZINC ALLOY COATED PRODUCT

**Robert G. Hart, Bethlehem, and Herbert E. Townsend, Center Valley, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.**

**Continuation-in-part of Ser. No. 273,285, Jun. 15, 1981, abandoned. This application May 12, 1982, Ser. No. 377,511**

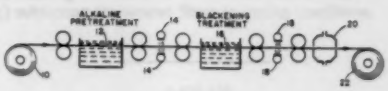
**Int. Cl.³ C23F *5/02***

**U.S. Cl. 148—6.14 R** **6 Claims**

1. A method of treating a metallic coated product to form a thin, uniformly black, light-absorptive surface layer thereon, said product comprising a core having a coating comprising, by weight, 25 to 70% aluminum, at least 0.5% silicon based on the aluminum content, balance essentially zinc, characterized by the steps of

(1) treating said product in an aqueous alkaline solution for a time (X), where the aqueous solution has a concentration (Y), and the product (XY) is in the range of 1 to 20, where:
(X)=time in seconds
(Y)=concentration in vol. %/100,
to form on said product a zinc-rich surface,

(2) rinsing the alkaline solution from said product, and




(3) treating said zinc-rich surfaced product in the alkaline pretreated and rinsed condition for at least 2 seconds in an acidic aqueous solution of a nickel-antimony blackening bath in which the zinc-rich surface reacts with said bath to form a thin, uniformly black, light absorptive layer having a thickness of at least 80 nm on the surface of said metallic coated product, and an average absorptance of at least 95% over the solar radiation spectrum.

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**4,479,833**

## PROCESS FOR MANUFACTURING A SEMI-FINISHED PRODUCT OR A FINISHED COMPONENT FROM A METALLIC MATERIAL BY HOT WORKING

**Gernot Gessinger, and Günther Schröder, both of Birmenstorf, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

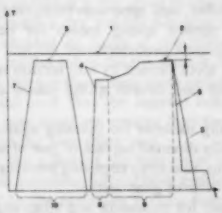
**PCT No. PCT/CH82/00082, § 371 Date Feb. 2, 1983, § 102(e) Date Feb. 2, 1983, PCT Pub. No. WO83/00168, PCT Pub. Date Jan. 20, 1983**

**PCT Filed Jun. 22, 1982, Ser. No. 466,339**

**Claims priority, application Switzerland, Jun. 26, 1981, 4244/81**

**Int. Cl.³ C22D *1/04, 1/08, 1/10*; C21D *7/14***

**U.S. Cl. 148—11.5 R** **14 Claims**



1. Process for manufacturing a semi-finished product or a finished component from a metallic material, by hot working, wherein a workpiece, which initially exists as a cast billet, a rolled billet, or a forged blank, is heated to a temperature which lies 5 degrees Kelvin, up to a maximum of 0.15 $T_{sol}$ in degrees Kelvin, below the solidus temperature of the material, the workpiece is thereupon brought into contact with a tool, the temperature of which is kept constant, and is lower, by 5 degrees Kelvin, up to 0.15 $T_{sol}$, in degrees Kelvin, than the solidus temperature of the material, but is higher than the temperature to which the workpiece is preheated, and the workpiece is quasi-isothermally deformed, at a deformation rate $\phi$, referred to the change in cross-section, of 0 to 10 $s^{-1}$, in such a manner that the temperature-difference over the entire cross-section of the workpiece, and considered over the total duration of the working operation, does not exceed 50° C., $\phi$ being defined in the following manner:

$\phi = d\phi/dt = v/h$

where

v denotes the tool speed,

h denotes the height of the workpiece, and

$T_{sol}$ denotes the solidus temperature in degrees Kelvin, and the workpiece is finally subjected to a cooling step.

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4,479,834

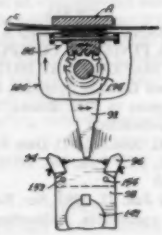
## ARTICLE STRAPPING METHOD AND APPARATUS

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Chicago, Ill.

Filed Nov. 19, 1982, Ser. No. 442,524

Int. Cl.³ B29C 27/08

U.S. Cl. 156—73.5 23 Claims



1. Apparatus for securing a loop of thermoplastic strap around an article so that two overlapping portions of said strap are bonded together, said apparatus comprising:

an anchored torsion spring means for being torsionally stressed to store a predetermined amount of energy;

an arc of gear teeth carried by said torsion spring means for rotation with said torsion spring means about an axis of rotation;

a strap engaging member for pressing against and gripping the outwardly directed surface of one of said overlapping strap portions, said strap engaging member defining a rack gear with a row of gear teeth;

mounting means for mounting said strap engaging member with the gear teeth of said rack gear engaged with at least some of said teeth of said arc of gear teeth on said torsion spring means;

an anvil defining a planar strap engaging surface against which the outwardly directed surface of the other of said overlapping strap portions is pressed;

means for effecting relative movement between said anvil and at least said strap engaging member to compress said overlapping strap portions therebetween; and

means for torsionally stressing and then removing the torsion stress from said torsion spring means after said predetermined amount of energy has been stored whereby said strap engaging member is oscillated on said mounting means in linear motion against the overlapping strap portions as said arc of gear teeth is rotated whereby bodily sliding frictional movement occurs between the overlapping strap portions to melt interface regions which subsequently solidify.

4,479,835

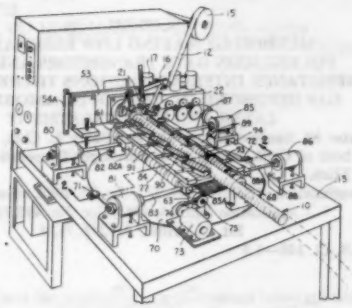
## APPARATUS AND METHOD FOR FORMING WIRE REINFORCED HELICALLY FABRICATED TUBING

Thomas A. Kutnyak, Greenwood, and Arthur R. Campbell, Abbeville, both of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Jun. 1, 1982, Ser. No. 384,012

Int. Cl.³ B65H 81/00

U.S. Cl. 156—143 2 Claims



1. A method of making flexible tubing of at least one wire helix of a certain pitch and lead angle covered by helically wrapped tape which comprises:

(a) axially rotating a cylindrical mandrel surface,

(b) passing one run of a belt of a width a plurality of times the wire helix pitch and having a plurality of grooves extending in the direction of belt travel between belt-driving rollers resiliently against only a portion of the circumference of the mandrel surface at an angle to the rotation axis of the mandrel surface equal to the helix lead angle,

(c) drawing the wire helix loosely about the mandrel and between the mandrel and the run of the belt,

(d) drawing the tape between the mandrel and the run of the belt so that the tape is wrapped about the helix with overlapping turns, and

(e) adhering together the overlapping turns of the tape.

2. Apparatus for continuously forming flexible tubing of at least one wire helix of a certain pitch and lead angle covered by helically wrapped tape comprising:

(a) a mandrel rotatable about a longitudinal axis,

(b) a pair of belt-driving rollers each having a length a plurality of times the pitch of the helix, one of which is a driving roller and the other of which is an idling roller,

(c) an endless belt of a width a plurality of times the pitch of the helix and having a plurality of parallel grooves extending in the direction of the belt travel and spaced apart equal to the helix pitch,

(d) one run of said belt passing around and being positively driven by the belt-driving rollers and passing in resilient contact with only a portion of the circumference of the mandrel at an angle to the mandrel axis equal to the helix lead angle,

(e) supplies of said wire and said tape,

(f) wire forming means for forming loosely about the mandrel the wire helix which is drawn between the mandrel and the belt grooves,

(g) tape guiding and adhering means for wrapping the tape about the wire helix with joined tape convolutions adhered together, and

(h) opposed pairs of guide rollers engaging the tape wrapped wire helix on opposite sides thereof and being vertically tilted at the helix lead angle to engage the helix tangentially.

4,479,836

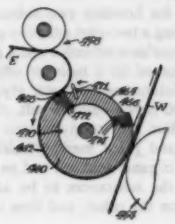
## METHOD FOR EFFECTING SECUREMENT OF ALTERNATING STRETCHED AND UNSTRETCHED ELASTIC RIBBON TO A MOVING WEB

William E. Dickover, Lyons; Ladislav J. Klasek, North Riverside, and Anthony Passafiume, Burbank, all of Ill., assignors to Johnson & Johnson Baby Products Company, Skillman, N.J.

Continuation of Ser. No. 343,621, Jan. 28, 1982, abandoned, which is a continuation of Ser. No. 150,515, May 16, 1980,. This application Oct. 17, 1983, Ser. No. 541,473

Int. Cl.³ B65H *25/00*

U.S. Cl. 156—164 8 Claims



1. The method of securing an elastic member to a flexible web of material defining diaper components comprising the steps of:

(a) moving said web along a path;

(b) feeding a continuous strip of said elastic member to form at least one unstretched segment and elongating a portion of said strip to form a stretched segment;

(c) causing said segments to travel along said path adjacent said web and securing only said stretched segment to a predetermined portion of said web; and

(d) severing said continuous strip of elastic member to separate at least one stretched segment from said continuous strip.

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4,479,837

## FILAMENT REIN FOR CEMENT IMPREGNATED WITH RESIN OF THICKENABLE COMPOSITION BASED ON AN ADDUCT OF ALKADIENE POLYMERS AND ACID ANHYDRIDE

Guy Senatore, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 355,277, Mar. 5, 1982, Pat. No. 4,423,177. This application Aug. 16, 1983, Ser. No. 523,532

Int. Cl.³ B65H *81/00*; B32B *5/00*

U.S. Cl. 156—169 8 Claims

1. Pultrusion process comprising

(a) pulling continuous fibers through a bath of a composition comprising an adduct of a medium to high vinyl alkadiene polymer, said polymer having about 60 to about 95% of the alkadiene units bonded in the 1,2-mode, and a cyclic or acyclic anhydride of a mono or dicarboxylic acid, a thickening agent selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof, and an organic peroxide and a thickening additive selected from the group consisting of water, alkanols, phenols, amines and mixtures thereof such as to produce fibers coated with said composition,

(b) pulling the fibers so coated through a die to remove excess composition,

(c) heating the fibers of step (b) at a temperature above the activation temperature of the organic peroxide to cross-link and harden the composition.

6. Filament winding process comprising

(a) coating one or more continuous fibers with a composition comprising pulling continuous fibers through a bath of a composition comprising an adduct of a medium to high vinyl alkadiene polymer, said polymer having about 60 to 95% of the alkadiene units bonded in the 1,2-mode, and a cyclic or acyclic anhydride of a mono or dicarboxylic acid, a thickening agent selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof, and an organic peroxide and a thickening additive selected from the group consisting of water, alkanols, phenols, amines and mixtures thereof such as to produce fibers coated with said composition,

(b) winding the coated fiber or fibers onto a body,

(c) subjecting the wound fibers to curing conditions.

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4,479,838

## COUPON STRUCTURE AND METHOD OF USING THE SAME

Robert J. Dunsirn, Appleton, and Duane R. Dunsirn, Neenah, both of Wis., assignors to Mid America Tag & Label Company, Inc., Neenah, Wis.

Filed Jun. 22, 1982, Ser. No. 390,976

Int. Cl.³ B32B *31/04, 31/12*; B42D *15/00*

U.S. Cl. 156—247 23 Claims

1. A method for removably mounting a coupon on a mounting surface, the method comprising the steps of:

(a) applying an adhesive to the under side of a base sheet;

(b) releasably adhering a top sheet to the upper side of the base sheet with a dry residue adhesive not activated by moisture adapted to leave a substantially transparent, non-tacky residue when the top sheet is removed from the base sheet, the top sheet, base sheet and dry residue adhesive selected such that the internal cohesion of the top sheet and base sheet are greater than the adhesion of the top sheet to the base sheet; and

(c) applying and adhering the base sheet with adhered top sheet to the mounting surface with greater adhesion of the base sheet to the mounting surface than the adhesion of the top sheet to the base sheet, whereby the top sheet may be removed from the base sheet with both sides of the top sheet non-tacky and visually unobstructed by adhesive, leaving the base sheet adhered to the mounting surface.

10. A coupon structure comprising:

(a) a non-transparent base sheet having upper and under sides with printed material on its upper side, and adapted to be substantially nonreleasably adhered by its under side to a mounting surface; and

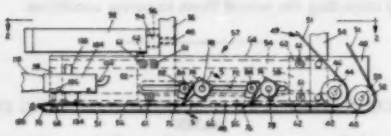
(b) a removable top sheet releasably adhered to the upper side of the base sheet by a substantially transparent layer of dry residue adhesive not activated by moisture, the top sheet having printed material on both sides thereof, such that, after the base sheet is applied to the mounting surface, the top sheet can be removed to leave a non-tacky base sheet, the removed top sheet being dry and non-tacky, and the printed material on the top sheet and base sheet being visually unobstructed by adhesive residue.

4,479,839

## LABELING MECHANISM

Gerald W. Tasma, Grand Rapids, Mich., assignor to Grand Rapids Label Company, Grand Rapids, Mich.

Filed Mar. 2, 1983, Ser. No. 471,072
Int. Cl.³ B65C 9/18
U.S. Cl. 156—249 14 Claims



1. A labeling mechanism for rapidly dispensing labels which are removably attached to a backing strip and for accurately applying each of the labels to different ones of a plurality of articles, the labeling mechanism comprising:

support means;

web supply means mounted to the support means for feeding and guiding a lable web along a predetermined path, said web supply means including means for at least partially peeling labels seriatim from the backing strip;

labeling head means mounted to the support means along the predetermined path and adjacent the peeling means for transferring the labels from the backing strip to the articles;

web advancing means mounted to the support means along the predetermined path for intermittently advancing the label web along the predetermined path, the web advancing means comprising a carriage, a pressure plate secured to the carriage and providing a surface over which the label web passes, and a finger pivotably mounted to the carriage over the pressure plate, the finger having an edge adapted to abut the rear edge of at least one of the labels on the backing strip when the label containing-backing strip is positioned on the surface of the pressure plate, and means to reciprocably move the carriage and pressure plate in unison along the predetermined path, the angle of the finger with respect to the web being such that the finger clamps the web against the pressure plate as the finger moves in one direction in abutting relationship to the label edge and applies substantially no clamping forces as the finger moves in an opposite direction; and

control means for synchronizing the reciprocating movement of the carriage and the labeling head means to transfer labels to articles as they are peeled from the peeling means.

12. A method for rapidly dispensing labels which are removably attached to a backing strip, and for accurately applying each of the labels to different ones of a plurality of articles, the method comprising the steps of:

positioning a label web along a predetermined path which includes a horizontal pressure plate;

intermittently exerting a vertical force to the backing strip in response to contacting the rear edges of the labels with a force applying member, the force being sufficient to clamp the backing strip against the pressure plate;

applying a suction force to a label on the label web while the backing strip is abruptly changing direction of movement;

holding the label by suction means after the label is removed from the backing strip; and

applying a high pressure air stream to the held label, thereby blowing the label onto the article.

4,479,840

## TWO-PART ADHESIVE AND BONDING METHOD EMPLOYING SAME

Shuji Takegawa, Suita, and Tadao Kunishige, Takatsuki, both of Japan, assignors to Sunstar Giken Kabushiki, Osaka, Japan

Continuation-in-part of Ser. No. 179,461, Aug. 19, 1980, Pat. No. 4,386,992, which is a continuation-in-part of Ser. No. 122,702, Feb. 19, 1980, abandoned. This application Mar. 1, 1983, Ser. No. 470,930
Claims priority, application Japan, May 11, 1979, 54-58339
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.³ C09J 5/00; C08J 3/00
U.S. Cl. 156—327 9 Claims

1. A method for bonding two substances together which comprises applying a two-part adhesive comprising an aqueous synthetic resin emulsion adhesive and a gelling agent comprising a combination of (a) a member selected from the group consisting of calcium pantothenate, glycine calcium salt, alanine calcium salt, serine calcium salt, threonine calcium salt, methionine calcium salt, phenylalanine calcium salt and calcium aspartate and (b) a member selected from the group consisting of an organic acid salt and an inorganic acid salt to at least one of the substances to be adhered, disposing the substances one on the other, and then contact-pressing them together.

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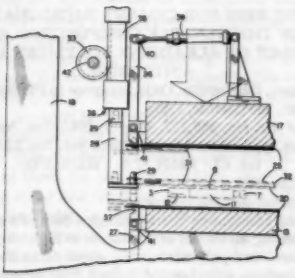
4,479,841

## INSERTION AND REMOVAL APPARATUS FOR PRESS CAULS

Peter Rapp, Eppingen-Muehlbach, and Heinrich Ritterhoff, Besigheim, both of Fed. Rep. of Germany, assignors to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,333
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1981, 3139581
Int. Cl.³ B32B 31/00; B23K 27/00; A01N 65/00; B30B 15/30
U.S. Cl. 156—379.8 5 Claims



1. Apparatus for changing upper and lower press cauls in a press having upper and lower press platens, comprising:

(a) at least two rods, one rod arranged adjacent each side of said press,

(b) a pickup mandrel attached to each of said rods,

(c) said press cauls having at least one receiving loop on each side thereof for receiving said mandrel,

(d) control means to position said mandrels within said receiving loops and remove said mandrels from said receiving loops,

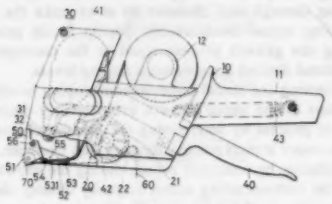
(e) caul clamping means releasably clamping each of said cauls to their corresponding press platens, and

(f) means for transporting said cauls, released from their corresponding press platens and released from said mandrels, out of said press and for transporting another pair of cauls into said press.

## 4,479,842
## MANUALLY-OPERATED LABELER

Mituo Fujita, Sakatoshi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 444,814
Int. Cl.³ B65C 11/02
U.S. Cl. 156—384 4 Claims



1. A manually-operable labeler which removes and prints upon labels successively stuck to a carrier strip, comprising:

a. a casing having a handle extending rearwardly thereof;

b. a lever pivotally mounted to said casing opposed to said handle so as to be reciprocally pivotable toward and away from said handle;

c. a carrier strip feeding mechanism housed in said casing, engagable with the carrier strip and responsive to pivoting of said lever to feed a fixed length of carrier strip, said carrier strip remaining stationary during a portion of the reciprocating pivotal movement of said lever;

d. a printing device mounted in said casing and responsive to pivoting of said lever while said carrier strip is stationary to move into downward engagement with one of the labels from the strip so as to perform printing thereon; and

e. a label receiving member detachably mounted to said casing at a front bottom portion thereof, said label receiving member including;

(1) a support frame;

(2) a label depressing member having an outer label engaging surface, mounted to said support frame;

(3) a resilient label receiving segment forward of said depressing member extending parallel to the label engaging surface of said label depressing member, one end of said label receiving segment being integrally connected to said support frame, the other end of said label receiving segment comprising a free end, said label receiving segment having a front edge defining a turnback part extending parallel to the label engaging surface of said label depressing member, spaced from said label depressing member so as to define a label forwarding space of fixed dimensions therebetween,

(4) a label holding member extending above said label forwarding space from said support frame toward and above said label receiving segment, and

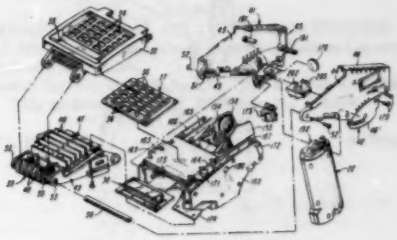
(5) means, at said support frame, for detachably mounting said label receiving member to said casing;

said carrier strip feeding mechanism comprising means for feeding the carrier strip rearwardly along said label receiving segment and downwardly across said turnback part such that the labels are detached from the carrier strip at said turnback part and guided by said label holding member across said label forwarding space and beneath said label depressing member.

## 4,479,843
## LABELER

Lance D. Neuhard, Huber Heights, and James A. Makley, Miamisburg, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 12, 1983, Ser. No. 484,345
Int. Cl.³ B65C 11/02
U.S. Cl. 156—384 12 Claims



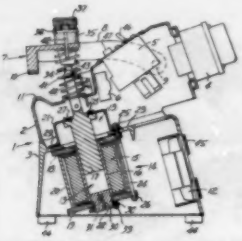
1. A compact hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing, a handle connected to the housing, the housing having spaced sides, means on the housing for supporting a label roll of pressure sensitive labels, means for printing on labels, the printing means including an electrically selectable print head having a plurality of printing elements, means for delaminating printed labels, means for advancing the carrier web, means defining a path for guiding the web from the label roll to the printing means, to the delaminating means, and to the web advancing means, a keyboard on the housing, an array of printed circuit boards electrically connecting the keyboard and the print head, wherein the circuit board array includes a first circuit board in underlying relationship to the keyboard, second and third circuit boards disposed on opposite sides and inclined relative to the first circuit board, means including a flexible ribbon connector for electrically connecting the first circuit board to the second circuit board, means including a flexible ribbon connector for electrically connecting the first circuit board to the third circuit board, a fourth circuit board, means including a flexible ribbon connector for electrically connecting the second circuit board and the fourth circuit board, the second and fourth circuit boards being disposed in side-by-side relationship, a fifth circuit board, means including a flexible ribbon connector for electrically connecting the third circuit board and the fifth circuit board, the third and fifth circuit boards being disposed in side-by-side relationship.

3. A compact hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing, a handle connected to the housing, the housing having spaced side portions, means in the housing for advancing a carrier web, a subframe disposed in the housing between the side portions, means for printing on labels, the printing means including a print head having electrically selectable printing elements, means for delaminating printed labels, means for applying printed labels, the subframe having means defining a path for guiding the web from a label supply roll to the printing means, to the delaminating means and to the web advancing means, a keyboard, circuitry including a printed circuit board electrically connecting the keyboard and the print head, the printed circuit board being disposed in space between one side portion of the housing and the subframe, means for securing the subframe to the housing, and wherein the printed circuit board is in spaced relationship to the housing.

## 4,479,844
## IMPULSE-ACTION HEAT-SEALER

Teruo Yamada, Suita, Japan, assignor to Yugen Kaisha Fuji Seisakusho, Japan

Filed Mar. 21, 1983, Ser. No. 477,089
Claims priority, application Japan, Jun. 21, 1982, 57-92758[U]
Int. Cl.³ B30B 15/34
U.S. Cl. 156—583.2 4 Claims



1. An impulse-action heat-sealer comprising a body proper, an electromagnet having an electromagnetic coil, an iron core movably mounted along an axis of said coil and a pressing sealing lever having an actuation rod connected to said iron core, wherein said coil is mounted on said body proper, said coil is of the direct-current energization type and said electromagnet is provided with an air-damper for buffering movement of said pressing-sealer lever.

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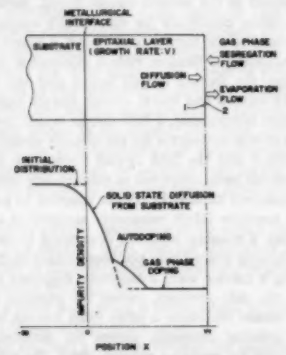
## 4,479,845
## VAPOR GROWTH WITH MONITORING

Jun-ichi Nisizawa, and Masaaki Fukase, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

Continuation of Ser. No. 161,980, Jun. 20, 1980, abandoned.
This application Jun. 14, 1982, Ser. No. 388,198
Claims priority, application Japan, Nov. 22, 1979, 54-151206; Nov. 22, 1979, 54-151207; Nov. 22, 1979, 54-151208; Nov. 22, 1979, 54-151209
Int. Cl.³ C30B 25/16
U.S. Cl. 156—601 6 Claims




1. Method of controlled doped vapor growth of a doped crystalline semiconductor layer having a desired impurity density distribution profile on and within a semiconductor substrate, comprising the steps of:

(a) defining said desired impurity density distribution profile on and within the semiconductor substrate as a function of a position coordinate located at an arbitrary position in the grown doped crystalline semiconductor layer to be produced and corresponding to a distance measured from the boundary between said substrate and said grown layer,

(b) calculating, by computer means, the desired instantaneous doping level on the surface of the growing layer, corresponding to said grown layer, to be controlled at an arbitrary time during the doped vapor growth process as measured from the start of the doped vapor growth,

(c) performing the doped vapor growth process in a reaction chamber by passing a doped vapor growth providing vapor stream through said chamber according to the calculated desired instantaneous doping levels while controlling the gaseous composition of the vapor stream passing through said chamber so as to make the corresponding actual instantaneous doping levels produced during the growth process equal to the corresponding calculated desired instantaneous doping levels,

(d) monitoring the actual instantaneous doping levels from the start of the vapor growth progressively during the growth process by determining the gaseous composition of the vapor stream passing through said chamber,

(e) calculating, by computer means, during the growth process the corresponding actual impurity density distribution profile at the total growth time based upon each monitored said actual instantaneous doping level,

(f) calculating by computer means, during the growth process a deviation of the calculated desired instantaneous doping level corresponding to each monitored said actual instantaneous doping level, according to said step (b), and

(g) revising said calculating desired instantaneous doping level to be controlled during the remainder of the growth process according to each such deviation.

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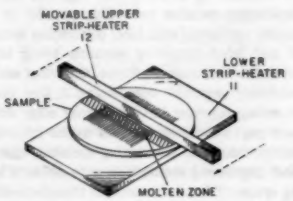
## 4,479,846
## METHOD OF ENTRAINING DISLOCATIONS AND OTHER CRYSTALLINE DEFECTS IN HEATED FILM CONTACTING PATTERNED REGION

Henry I. Smith, Sudbury, and Michael W. Geis, Acton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 23, 1982, Ser. No. 391,130
Int. Cl.³ C30B 13/06
U.S. Cl. 156—603 13 Claims




1. A method of entraining dislocations and other crystalline defects in a film on a substrate which method includes the steps of intentionally creating a predetermined pattern in a region embracing at least one of said film and said substrate to form a patterned region,

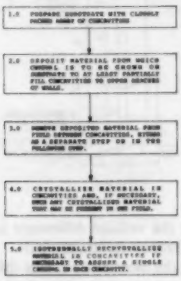
and processing said film by passing a heated zone through said film in a predetermined direction to establish dislocations and other crystalline defects in said film entrained to follow said pattern and located at predetermined positions related to said pattern.

4,479,847

## EQUILIBRIUM CRYSTAL GROWTH FROM SUBSTRATE CONFINED LIQUID

James O. McCaldin, Pasadena, Calif., and Thomas F. Kuech, Ossining, N.Y., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 30, 1981, Ser. No. 335,889
Int. Cl.[3] C30B 19/12
U.S. Cl. 156—624 12 Claims



1. A method for in situ growth of an array of single crystals from nonwetting material deposited on an inert substrate comprising the steps of

preparing a surface of said substrate with an array of concavities which, will the substrate uniformly heated, stably contain liquid material at the substrate temperature by the combined effects of surface tension and geometry, said array of concavities having a field between every pair of concavities having a width that is small relative to the smallest dimension of the concavities, said array having a geometry that maximizes the total concavity area, which is large relative to the total field area,

depositing said material from which said crystals are to be grown on said prepared surface of said substrate to at least partially fill said concavities,

chemically removing deposited material from said field without a mask, and

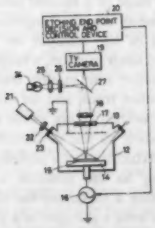
crystallizing a single crystal from said material in each concavity with the substrate uniformly heated and said material at the same temperature.

4,479,848

## ETCHING METHOD AND APPARATUS

Toru Otsubo, Fujisawa; Susumu Aiuchi, and Takashi Kamimura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,941
Claims priority, application Japan, Feb. 14, 1983, 58-21423
Int. Cl.[3] H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02
U.S. Cl. 156—626 14 Claims



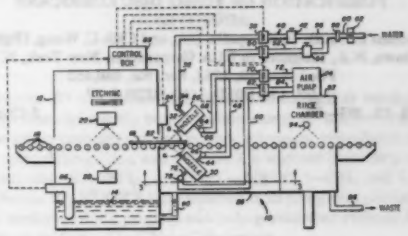
1. An etching method comprising the step of focusing by a projecting optical system an optical image which is reflected from a region of a dicing stripe pattern on a substrate to-be-etched during selective etching, the step of converting the focused pattern into an image signal by an image detector, the step of finding a change of contrast in the region of the dicing stripe pattern on the basis of the image signal, and the step of deciding a state of etching on the basis of the found change of contrast.

4,479,849

## ETCHANT REMOVAL APPARATUS AND PROCESS

John J. Frantzen, San Jose, Calif., assignor to Koltron Corporation, Sunnyvale, Calif.

Division of Ser. No. 190,875, Sep. 25, 1980, Pat. No. 4,397,708.
This application May 27, 1983, Ser. No. 498,934
Int. Cl.[3] C23F 1/02
U.S. Cl. 156—640 4 Claims




1. A method for removing excess etchant from a workpiece after the workpiece exits an etching chamber in which the workpiece is exposed to the etchant, comprising the steps of:

sensing the presence of the workpiece as it exits the etching chamber;

sensing the specific gravity of the etchant in the etching chamber via a specific gravity sensing means designed to generate sensing signals;

subjecting the top surface of the workpiece to a gas-liquid spray whereby excess etchant is removed from the workpiece;

capturing the excess etchant as it is removed from the workpiece;

recycling the captured excess etchant to the etching chamber; and

exposing the lower surface of the workpiece to the gas-liquid spray in response to signals from the specific gravity sensing means so as to maintain a predetermined specific gravity for the etching chamber etchant.

4,479,850

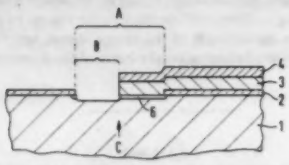
## METHOD FOR ETCHING INTEGRATED SEMICONDUCTOR CIRCUITS CONTAINING DOUBLE LAYERS CONSISTING OF POLYSILICON AND METAL SILICIDE

Willy Beinvogl, Munich, and Barbara Hasler, Stockdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,353
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315719
Int. Cl.[3] H01L 21/306; B44C 25/06; C03C 15/00; C23F 1/02
U.S. Cl. 156—643 10 Claims

1. In a method for etching a double layer semiconductor structure containing metal silicide layers or a metal silicide-polysilicon layer on a silicon substrate through a photoresist mask by means of reactive ion etching wherein dissociation

and ionization of reactant gases take place in a plasma, the improvement which comprises:




employing a mixture of chlorine gas and a highly reducing gas as the reactant gases.

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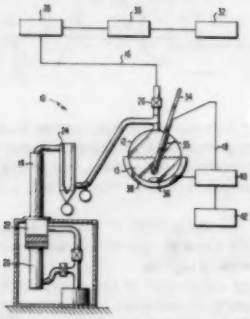
**4,479,851**
**PURIFICATION OF VIDEO DISC LUBRICANT ADDITIVES**

**Thomas E. Smith, Indianapolis, Ind., and Chih C. Wang, Hightstown, N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Nov. 10, 1982, Ser. No. 440,452**
**Int. Cl.³ B01D *3/10*; B32B *3/02***
**U.S. Cl. 203—80** **5 Claims**



1. A process for purifying a bis(hydroxyalkyl)disiloxane by batch distillation comprising the steps of:

(a) reducing the pressure on a batch of bis(hydroxyalkyl)-disiloxane feedstock at ambient temperature to $2\times10^{-1}$ Torr to remove low boiling volatile components absorbed and/or dissolved in said feedstock, and

(b) gradually increasing the temperature of said feedstock to about 135° C. and in such a manner that the pressure does not increase above about $2\times10^{-1}$ Torr, so as to produce a distilland having a viscosity of about 210±30 centipoise at 25° C.

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**4,479,852**
**METHOD FOR DETERMINATION OF CONCENTRATION OF ORGANIC ADDITIVE IN PLATING BATH**

**Perminder S. Bindra, Ossining; Allan P. David; Raymond T. Galasco, both of Binghamton, and David N. Light, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

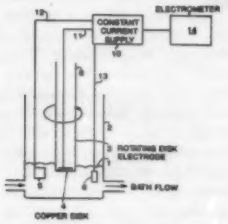
**Filed Jan. 21, 1983, Ser. No. 459,930**
**Int. Cl.³ G01N *27/46***
**U.S. Cl. 204—1 T** **22 Claims**

1. A method of determining the concentration of at least one organic additive in an acidic electrolytic copper plating bath comprising the steps of:

(a) preparing a cathode by electroplating a copper film onto a substrate by immersing the substrate in a copper plating bath and preplating copper thereon at a constant current density and constant voltage; said cathode being a rotating disk electrode;

(b) providing in an acidic electrolytic copper plating bath, said cathode from step (a), a reference electrode, and an anode;

(c) passing an electric current at a constant current density from said anode to said cathode;




(d) measuring the voltage difference between said cathode and said reference electrode; and

(e) comparing the measured voltage difference from step (d) with previous measured values for known concentrations of said organic additive.

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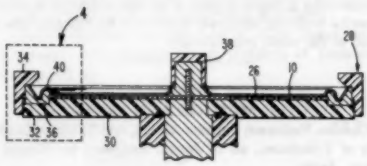
**4,479,853**
**METHOD FOR THE MANUFACTURE OF RECORD STAMPERS**

**John J. Prusak, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Mar. 29, 1984, Ser. No. 594,821**
**Int. Cl.³ C25D *1/20***
**U.S. Cl. 204—5** **3 Claims**



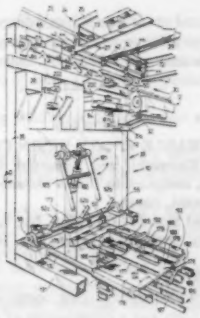

1. In the method for the manufacture of a record stamper having an inner edge of a first predetermined configuration, a recorded section having a negative information track defined therein and an outer edge of a second predetermined configuration; the improvement which comprises electroforming at least the outer edge of the stamper by providing a matrix having an unrecorded inner portion, a recorded portion having defined therein a positive information track corresponding to the negative information track and an unrecorded outer section; positioning an electroforming guide means having a configuration corresponding to the predetermined configuration of the edge to be electroformed at a preselected location on the matrix corresponding to the position of the edge of the stamper; electroforming a metal on the electroforming guide means and the matrix until a stamper of a preselected thickness is obtained; and separating the resultant stamper from the electroforming guide and the matrix, whereby a stamper is obtained having the edge thereof electroformed in the predetermined configuration.

4,479,854

## METHOD AND APPARATUS FOR STRIPPING CATHODES

Robert D. H. Willans; Edward G. Baggio, both of Trail; Harold K. Harper, Montrose; Eric L. Mawer, Fruitvale; Robert E. Manwell, and George H. Reeves, both of Trail, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Feb. 13, 1984, Ser. No. 579,339
Claims priority, application Canada, Feb. 14, 1983, 421505
Int. Cl.³ C25D 1/20, 17/00
U.S. Cl. 204—12 31 Claims



1. A method for stripping electro-deposited sheets of metal from cathode plates used in the electrolytic recovery of metals, each cathode plate having a head bar at one end for vertical support of the cathode plate, opposite side faces with metal deposits thereon, and vertical side edges having edge sticks mounted thereon and a pivotal guard piece forming a separate upper portion of one of said edge sticks, said method comprising: advancing said cathode plates crosswise to the direction of travel sequentially through a plurality of equispaced stations in succession by means of a reciprocating transfer carriage, said plurality of stations consisting of a feed station, an initial horizontal parting station, a main vertical stripping station, and a discharge station; said transfer carriage mounted for horizontal reciprocal travel above a pair of parallel, spaced-apart slide bars over a distance equal to the distance between a pair of adjacent stations, said transfer carriage having means formed thereon for engaging a cathode plate head bar at each station for advance of the cathode plates on the slide bars to a successive station; actuating detent means operable into and out of engagement with the opposite side edges of the cathode plates at the initial horizontal parting station and vertical stripping station for positioning the cathode plates and preventing sway of said cathode plates at each of the said stations; pivoting said guard piece upwardly away from the side edge of the cathode plate; initially parting the top edge of the metal deposit on each side face of the cathode plate from the cathode plate and bending the said top edges outwardly away from the cathode plate to form a gap between the top edges and the face of the cathode plate at the initial horizontal parting station; vertically reciprocating main stripping knives which engage the deposited metal at the gap on each side face of the cathode plate and strip metal deposits downwardly from each side face of the cathode plate for removal of the said metal deposits therefrom at the vertical stripping station; and removing stripped cathode plates at the discharge station.

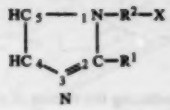
4,479,855

## GALVANIC DISPERSION DEPOSITION BATH

Martin Thoma, and Paul Buenger, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,852
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313871
Int. Cl.³ C25D 15/00
U.S. Cl. 204—16 19 Claims

1. A bath with a suspension stabilizer for a galvanic dispersion deposition of a metal coating on a substrate, said metal coating having embedded in the metal coating other particles, comprising a main electrolyte and a cation active imidazole derivative acting as said suspension stabilizer, said suspension stabilizer satisfying the general formula



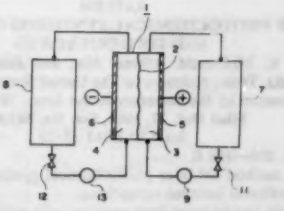
wherein $R^1$ is a monovalent hydrocarbon radical having at least four alphatically bound carbon atoms, $R^2$ is selected from the group consisting of methylene-, ethylene-, propylene-, and isopropylene-groups, and wherein X is selected from the group consisting of $—NH_2$, $—NHR^3$; $—NR^3R^4$, —OH, and $OR^5$, wherein $R^3$, $R^4$ and R5 are selected from the group consisting of methyl-, ethyl-, propyl-, and poly-glycolether radicals having up to five $—O—CH_2—CH_2$ groups.

4,479,856

## ZINC DENDRITE INHIBITOR

Yasuo Ando, Mitaka, Japan, assignor to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,373
Claims priority, application Japan, Aug. 9, 1982, 56-137358
Int. Cl.³ C25D 3/22
U.S. Cl. 204—55 R 5 Claims



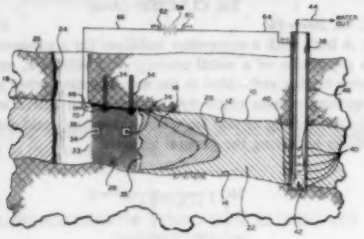
1. A zinc dendrite inhibitor for addition to a zinc halide-containing electrolyte which deposits zinc on a negative electrode through an electrochemical reaction, said inhibitor comprising: a quaternary ammonium salt and at least two metal ions selected from the group consisting of from about $10^{-4}$ to about $10^{-3}$ mole/l of divalent lead ions, from about $10^{-4}$ to about $10^{-3}$ mole/l of divalent tin ions, and less than about $10^{-2}$ mole/l of divalent cadmium ions.

**4,479,857**

## METHOD AND APPARATUS FOR RADON CONTROL

**Hugh M. Barton, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Sep. 1, 1983, Ser. No. 528,756**
**Int. Cl.³ C25C *1/22***
**U.S. Cl. 204—130** **20 Claims**



1. A method of reducing the release of radon from a radium bearing rock face in a subterranean formation, comprising:
   (a) positioning a cathode in said formation a distance from said rock face;
   (b) positioning an anode in said formation in electrical contact with at least a portion of said rock face; and
   (c) applying an electrical potential between said cathode and said anode sufficient to achieve current flow between said anode and said cathode whereby radium ions are moved from said anode to said cathode through said formation thereby reducing the amount of radioactive decay of radium to radon at the rock face.

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**4,479,858**

## PHOTOACTIVATED CATALYTIC POLYMERIZATION OF MONOEPOXIDES

**Ronald L. Yates, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Jun. 21, 1982, Ser. No. 390,437**
**Int. Cl.³ B01J *19/12***
**U.S. Cl. 204—158 R** **14 Claims**

1. A process comprising polymerizing an alkylene oxide or mixture of alkylene oxides in the presence of a catalytic amount of at least one photoactivated species of a rhenium carbonyl coordination compound precursor and under reaction conditions, at a temperature of from 0° C. to 50° C., to form a liquid polyether having a weight average molecular weight of from about 2,000 to about 30,000.

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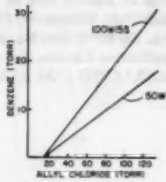
**4,479,859**

## LASER PHOTOCHEMICAL SYNTHESIS OF BENZENE AND ITS DERIVATIVES

**Joseph K. McDonald, Athens, Ala., and James A. Merritt, Pulaski, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 27, 1983, Ser. No. 565,807**
**Int. Cl.³ B01J *19/12***
**U.S. Cl. 204—158 R** **7 Claims**

1. A method for laser photochemical synthesis of benzene and substituted benzene comprising:
   i. filling one or more laser reaction cells with an allyl halide selected from allyl chloride, 2-methyl-3-chloropropene, 2,3-dichloropropene, allyl bromide, and allyl fluoride to a pressure from about 10 to about 100 torr;
   ii. irradiating said selected allyl halide with a power level from about 25 to about 150 watts of a cw $CO_2$ tunable laser, tuned to a radiation line selected that is resonant with an absorption band of said allyl halide, said irradiating accomplished over a time period from about 0.2 second to about 60 seconds by employing said cw $CO_2$ tunable laser tuned to radiation line such as P(36), 929.02 $cm^{-1}$, P(32), 931.00 $cm^{-1}$, P(26), [00°1-10°0] 938.69 $cm^{-1}$, or P(22), 942.38 $cm^{-1}$ with the specified frequencies being resonant with said absorption band of said allyl




halide selected to thereby achieve dissociation of said allyl halide and to achieve a laser-induced photochemical synthesis of benzene and substituted benzene.

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**4,479,860**

## PHOTO-CURABLE EPOXY RESIN COMPOSITION

**Shuzi Hayase, Kawasaki, and Yasunobu Onishi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Sep. 12, 1983, Ser. No. 531,316**
**Claims priority, application Japan, Sep. 14, 1982, 57-158889**
**Int. Cl.³ C08G *59/68, 59/70***
**U.S. Cl. 204—159.11** **8 Claims**

1. A photo-curable epoxy resin composition which comprises an epoxy resin and a combination of an aluminum compound and a silicon compound having a peroxysilyl group as a hardening catalyst.

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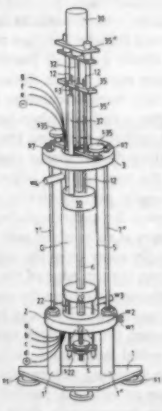
**4,479,861**

## METHOD AND APPARATUS FOR PREPARATIVE GEL ELECTROPHORESIS

**Matthias Hediger, 25 Old Mountain Rd., Farmington, Conn. 06032**

**Filed Jul. 19, 1983, Ser. No. 515,064**
**Claims priority, application Switzerland, Jul. 23, 1982, 4521/82**
**Int. Cl.³ G01N *27/28***
**U.S. Cl. 204—180 G** **22 Claims**



1. A method of forming a gel column for preparative electrophoresis comprising

providing inner and outer coolable cylinders and a station-

ary lower end adapter at the bottom thereof forming an annular chamber;

providing a source of polymerizable gel solution having selectable characteristics;

providing an upper end adapter which is movable between the upper end of the cylinders and a position adjacent the lower end adapter;

conducting polymerizable gel solution from the gel source into the space between the adapters and the cylinders while the upper adapter is concurrently elevated, thereby arranging the gel solution in gradients and building a gel column in the chamber, until the desired column height is reached;

and allowing the gel to polymerize.

5. An apparatus for preparative gel electrophoresis comprising

an outer coolable cylinder;

an inner coolable cylinder within said outer cylinder; and

upper and lower adapters between said inner and outer cylinders, each of said adapters being axially movable and having

means forming fluid seals between said adapter and said cylinders,

electrode means connectable to a source of electrical energy for forming an electric field between said adapters, and

duct means in each of said adapters for conducting fluids into and out of said adapters to comprise an electrode and elution buffer rinsing system,

said outer and inner cylinders and said upper and lower adapters defining a chamber for receiving a column of separating material through which said electric field passes.

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**4,479,862**

## SPUTTERING

**James W. Swenson, Minneapolis, Minn., assignor to Vertimag Systems Corporation, Minneapolis, Minn.**

**Filed Jan. 9, 1984, Ser. No. 569,141**

**Int. Cl.³ C23C *15/00***

**U.S. Cl. 204—192 R** **25 Claims**

1. In a method of sputter deposition of a depository material from a cathode to a target material supported on a target substrate, the improvement which comprises sputter depositing said depository material from said cathode onto a plastic film, which is supported during said sputter deposition by a layer of a urethane or silicone elastomer, which is in turn supported by said target substrate.

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**4,479,863**

## CELL TOP INSULATOR

**Ronald N. Honey, Rossland; Robert E. Manwell, Trail; Clifford J. Krauss, Trail, and Douwe Ybema, Trail, all of Canada, assignors to Cominco Ltd., Vancouver, Canada**

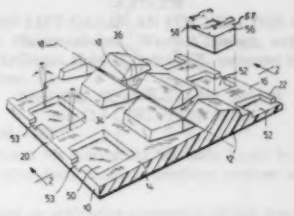
**Filed Apr. 2, 1984, Ser. No. 595,897**

**Claims priority, application Canada, Apr. 5, 1983, 425172**

**Int. Cl.³ C25B *9/00*; C25C *7/00*; C25D *17/00***

**U.S. Cl. 204—279** **8 Claims**

1. An insulator for use in electrolytic cells for the support of a spooled electrode contact bar and head bars of removable, alternating cathodes and anodes which are alternately supported at one side of the cell on said contact bar and on the other side of the cell on said insulator, said insulator comprising an elongated body having a longitudinal centre line, said body having a substantially flat bottom surface for mounting the insulator on the top of cell walls and said body having outwardly and downwardly sloping upper surfaces extending from said centre line to the side edges of the body, a row of equi-spaced shoulders formed longitudinally on each upper surface adjacent to the said centre line, each said row of shoulders having a transverse channel formed between each pair of adjacent shoulders for draining liquid towards a side edge of the body, a longitudinal V-shaped groove formed between the two rows of shoulders for supporting said spooled electrode



contact bar between said rows of shoulders, the shoulders of each row being longitudinally offset relative to the shoulders of the opposite row whereby the channels formed between the adjacent shoulders of one row are in alignment with and abut shoulders of the opposite row, a cavity formed in each upper surface opposite each shoulder between the shoulder and the respective edge of the body for receiving an insulating block therein, whereby the electrode contact bar can support an end of the head bar of a cathode or anode at one side of a cell and said blocks inserted in the cavities can support the opposite end of said head bar on the opposite side of the cell.

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**4,479,864**

## ANODE FOR ELECTROLYSIS OF SEAWATER

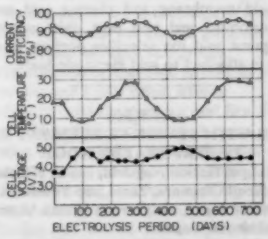
**Hideo Kanai; Akihiro Shinagawa, both of Maebashi; Takahiro Yamazaki, Shibukawa, and Reiichi Itai, Maebashi, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan**

**Filed Jul. 28, 1983, Ser. No. 518,220**

**Claims priority, application Japan, Aug. 4, 1982, 57-135200**

**Int. Cl.³ C25B *11/06***

**U.S. Cl. 204—290 F** **4 Claims**

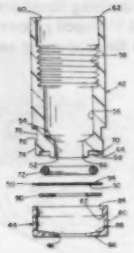



1. An anode for generating available chlorine from seawater by electrolysis which comprises a titanium or titanium alloy substrate having an outer active anode coating on said substrate, said outer coating consisting essentially of an active anode layer containing from 15 to 85% by weight of platinum, from 5 to 35% by weight of iridium dioxide and from 10 to 50% by weight of ruthenium dioxide.

## 4,479,865
## ELECTRODE ASSEMBLY

Alan H. Beder, Burlington, Mass., and Nai-Chiu J. Lai, Brookfield, Wis., assignors to Ingold Electrodes, Andover, Mass.

Filed Nov. 28, 1980, Ser. No. 211,281
Int. Cl.³ G01N 27/30
U.S. Cl. 204—415 14 Claims



1. A Replaceable cap assembly for use with an electrochemical analysis electrode that includes an electrode body and an ion selective portion at an end of said body,

said replaceable cap assembly comprising

a housing component for releasable attachment to said electrode body, said housing component having a cavity for receiving said ion selective portion when said housing component is attached to said electrode body and an end wall surface of conical shape that defines a port in communication with said cavity,

said conical end wall surface surrounding and sloping away from said port,

an annular groove in said concial end wall surface,

a first annular sealing element of O-ring type disposed in said groove in coaxial relation to said port,

a selectively permeable membrane seated on said first sealing element and extending across said port,

a second annular, disc type sealing element seated on said membrane in juxtaposed relation to said first sealing element,

a membrane securing component having a clamp portion that includes an inwardly extending annular flange that has a conical inner surface of mating configuration to said conical end wall surface, and snap action latch structure axially movable between released and latched positions, said latch structure in said latched position being in mechanical engagement with said housing component with said conical surface of said clamp portion compressing said juxtaposed first and second annular sealing elements against said membrane and placing said membrane in radial tension to seal said port, said membrane being seated against said ion selective portion when said cap assembly is attached to said electrode body.

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## 4,479,866
## GAS SENSOR WITH SENSITIVE ELEMENT ENCLOSED IN PERFORATED HOOD

Kohki Sone, Tokyo; Hatsuo Nagaishi, Zushi; Hidehiro Minami, Yokohama; Kenji Okamura, Zushi, and Yoshitaka Kitagasaki, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

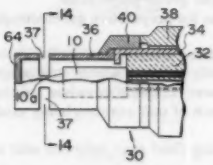
Continuation of Ser. No. 299,599, Sep. 4, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 537,549
Claims priority, application Japan, Oct. 17, 1980, 55-145277
Int. Cl.³ G01N 27/58
U.S. Cl. 204—425 1 Claim

1. A gas sensor, comprising:

a body adapted to be attached to an apparatus in which a gas subject to measurement flows;

an oxygen sensitive element having a plate-shaped substrate fixed to an end portion of said body and a laminate comprising an inner electrode formed on a major surface of said substrate, an oxygen ion conductive solid electrolyte layer formed on an outer surface of said inner electrode layer, and an outer electrode layer formed on an outer surface of said solid electrolyte layer; and

a generally hollow cylindrical hood having a cylindrical wall and an inner side and a free end, said hood being fixed to said body whereby said oxygen sensitive element is enclosed in said hood and entirely spaced from said inner side, said hood being formed with two arc-shaped slit type openings symetrically positioned in and extending circumferentially about said cylindrical wall to allow a portion of the gas flowing in said apparatus to flow into the interior of said hood and then flow out, each of said slit type openings being located between said oxygen sensitive element and said free end in a longitudinal direction with regard to a longitudinal axis of said hood whereby any cross-section of said hood taken in a plane generally perpendicular to said major surface of said substrate which intersects one of said slit type openings does not intersect said oxygen sensitive element;




said substrate being fixed to said body such that said major surface of said substrate lies generally parallel to the longitudinal axis of said hood.

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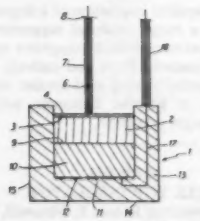
## 4,479,867
## ELECTROCHEMICAL SYSTEM FOR MEASURING THE PARTIAL OXYGEN PRESSURE IN A GASEOUS OR LIQUID ATMOSPHERE

Elisabeth Siebert; Jacques Fouletier, both of Grenoble, and Serge Vilminot, Castries, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoire, France

Filed Aug. 1, 1983, Ser. No. 518,919
Claims priority, application France, Aug. 2, 1982, 82 13473
Int. Cl.³ G01N 27/58
U.S. Cl. 204—426 19 Claims



1. An improved electrochemical device for measuring the partial pressure of oxygen in a liquid or gaseous atmosphere which electrochemical device has improved reversibility and shorter response time while being operative at low temperature, which electrochemical device comprises a working electrode responsive to oxygen, a solid electrolyte which comprises at least partially a halogenide mixture for providing ionic conduction by means of the halogenide ions and a peroxide for supplying the reactive ions for the working electrode and a reference electrode for maintaining constant, at least in its

immediate vicinity, the chemical potential of the halogen of the electrolyte, which electrode comprises at least partially a mixture of a metal and the halogenide corresponding to that of the electrolyte.

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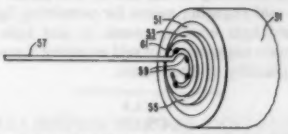
4,479,868

## GAS MEASURING PROBE

William H. McIntyre, Orrville, Ohio; Sai-Kwing Lau, Verona, and Subhash C. Singhal, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,159
Int. Cl.³ G01N 27/58
U.S. Cl. 204—426 16 Claims




5. In a gas measuring probe having an ion-conductive solid electrolyte cell, a first portion of said cell being exposed to a flue gas stream and a second portion of said cell being exposed to a reference gas stream, and electrode lead means extending from said first and said second cell portions and in electrical communication with a remote measuring circuit the improvement where at least one of said electrode means comprises a platinum gauze pad; a sintered electrode disposed on said solid electrolyte cell and adapted to receive thereon at least a portion of said platinum gauze pad such that the periphery thereof extends from said sintered electrode and such that said platinum gauze pad is in electrical communication with said solid electrolyte cell; a platinum disc secured to and in electrical communication with said gauze pad; and an alloy wire having one end thereof welded to said platinum disc and the other end thereof in electrical communication with said measuring circuit.

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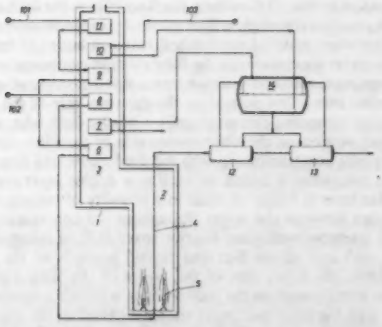
4,479,869

## FLEXIBLE FEED PYROLYSIS PROCESS

William C. Petterson, Missouri City, and Larry G. Hackemesser, Houston, both of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Dec. 14, 1983, Ser. No. 561,408
Int. Cl.³ C10G 9/36, 9/14; C07C 4/04
U.S. Cl. 208—130 5 Claims




1. In a process for steam cracking hydrocarbon feed in a tubular, fired furnace having a radiant section and a convection section wherein dilution steam is added to the hydrocarbon feed and the resulting mixed feed of dilution steam and hydrocarbon feed is heated to near incipient cracking temperature prior to introduction of the mixed feed to the radiant section, the improvement which comprises heating the hydrocarbon feed within the temperature range from about 370° C. to about 700° C. by indirect heat exchange with superheated steam and at least a portion of the superheated steam is generated in the convection section of said tubular, fired furnace.

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4,479,870

## USE OF LIFT GAS IN AN FCC REACTOR RISER

Harold U. Hammershaimb, Western Springs, and David A. Lomas, Arlington Heights, both of Ill., assignors to JOP Inc., Des Plaines, Ill.

Filed Feb. 29, 1984, Ser. No. 584,681
Int. Cl.³ C10G 11/20, 11/18
U.S. Cl. 208—164 6 Claims

1. A process for converting normally liquid hydrocarbons with an active fluid catalytic cracking catalyst which comprises:

(a) passing an upflowing suspension of hot regenerated active fluid catalytic cracking catalyst in a lift gas comprising hydrocarbons including not more than 10 mole % $C_3$ and heavier hydrocarbons through a lower portion of a vertically orientated riser conversion zone at a gas velocity of from about 1.8 to less than 12.2 meters per second, and for a catalyst residence time from about 0.5 to about 15 seconds, the weight ratio of catalyst to hydrocarbon in said lift gas being greater than 80; and

(b) introducing said normally liquid hydrocarbons into said upflowing suspension at a locus in said riser conversion zone downstream of said lower portion to form a catalyst-hydrocarbon mixture wherein the temperature and residence time are sufficient to effect the desired conversion.

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4,479,871

## PROCESS TO SEPARATE NATURAL GAS LIQUIDS FROM NITROGEN-CONTAINING NATURAL GAS

Ravindra F. Pahade, North Tonawanda; John B. Saunders, and James J. Maloney, both of Tonawanda, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 13, 1984, Ser. No. 570,664
Int. Cl.³ C10G 5/00; B01D 51/00
U.S. Cl. 208—340 22 Claims

17. A process for the separation of natural gas liquids from a feed stream having a pressure in the range of from 300 to 1500 psia and containing natural gas liquids, methane and not more than about 20 percent nitrogen comprising:

(1) partially condensing said feed stream to produce a first vapor stream and a first liquid stream:

(2) expanding to partially vaporize said first liquid stream;

(3) heating said partially vaporized stream;

(4) separating said partially vaporized stream into a second vapor stream and a second liquid stream;

(5) partially condensing said first vapor stream to produce a third vapor stream and a third liquid stream;

(6) introducing said second and third liquid streams into a demethanizer wherein they are separated into a methane-rich fraction and a bottom liquid containing natural gas liquids;

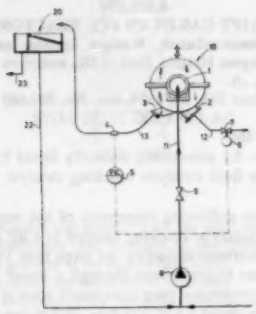
(7) partially vaporizing said bottom liquid to provide vapor, for upflow through the demethanizer, and remaining liquid; and

(8) recovering said remaining liquid as product natural gas liquids.

## 4,479,872
## METHOD AND APPARATUS IN SCREENING FIBER SUSPENSIONS

Nils A. L. Wikdahl, Bravallavagen 42, S-182 64 Djursholm, Sweden

PCT No. PCT/SE82/00427, § 371 Date Sep. 7, 1983, § 102(e) Date Sep. 7, 1983, PCT Pub. No. WO83/02470, PCT Pub. Date Jul. 21, 1983
PCT Filed Dec. 14, 1982, Ser. No. 537,452
Claims priority, application Sweden, Jan. 8, 1982, 8200073
Int. Cl.³ B03B 5/56
U.S. Cl. 209—258 10 Claims

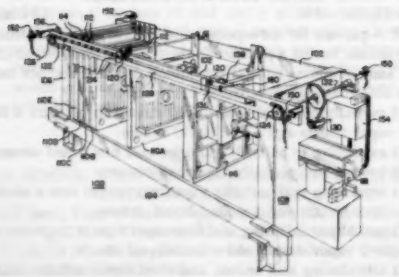


1. A method in screening a fibre suspension in a pressure screen with an inlet for the fibre suspension and outlets for accept and reject, conduit being connected to each outlet, characterized in that the flow through the reject conduit is measured and the difference between the measured value and a criterion value is determined, the flow through the reject conduit being changed in response to a function of the difference by changing the flow through the accept conduit.

## 4,479,873
## LIGHT CONTROLLED APPARATUS FOR MOVING FILTER PRESS PLATES

Lawrence L. Korczykowski, Eden, and Robert J. Zielinski, Dunkirk, both of N.Y., assignors to The Durkon Company, Inc., Dayton, Ohio

Filed Jan. 10, 1983, Ser. No. 456,671
Int. Cl.³ B01D 25/12
U.S. Cl. 210—91 8 Claims



1. In a filter press having a support frame with first and second ends and a plurality of filter plates arranged to define first and second ends and being movably mounted on said support frame between a fixed head plate at said first end of said filter plates and a movable head plate at said second end of said filter plates, apparatus for moving said plurality of filter plates comprising:

plate transporting means supported on said frame for moving said plurality of filter plates in reponse to control signals, said transporting means including means for engaging individual ones of said plurality of filter plates;

light emitting means mounted at said first end of said frame;

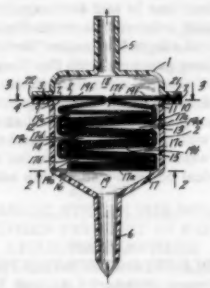
light detecting means mounted at said second end of said frame opposite to said first end and being aligned with said light emitting means for detecting light emitted from said light emitting means and for generating said control signals in response to detected light emitted from said light emitting means; and

shutter means positioned between said light emitting means and said light detecting means for normally preventing light from passing between said light emitting means and said light detecting means, said shutter means being coupled to said engaging means for permitting light to pass from said light emitting means to said light detecting means upon engagement of said engaging means with one of said plurality of filter plates.

## 4,479,874
## CONVOLUTED PLURAL LAYER FILTER ASSEMBLY

David J. Rosenberg, Glen Head, and Vlado I. Matkovich, Glen Cove, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,238
Int. Cl.³ B01D 29/06
U.S. Cl. 210—445 14 Claims



1. A convoluted plural layer filter assembly comprising a housing; means defining a fluid inlet and a fluid outlet in the housing, each opening into a fluid chamber; and, disposed in the fluid chamber across the line of fluid flow from the inlet to the outlet so that all flow from the fluid inlet to the fluid outlet must pass therethrough, a filter element composite comprising a filter sheet material sandwiched between layers of foraminous spacer sheet material, the filter element composite having an upstream side and a downstream side and separating the chamber into a first portion on the upstream side of the filter element composite communicating with the fluid inlet, and a second portion on the downstream side of the filter element composite communicating with the fluid outlet; the filter element composite is folded on itself as a double layer and the double layer is folded on itself in a plurality of convolutions, defining between the layers throughout the convolutions an open intercommunicating interior space in fluid communication with one of the first and second portions of the fluid chamber, the other side of the layers of the filter element composite throughout the convolutions is in fluid communication with the other portion of the fluid chamber; the plurality of convolutions extending transversely across the fluid chamber, back and forth across the line of fluid flow from the fluid inlet to the fluid outlet, so that the fluid flow in route to the fluid outlet from the fluid inlet may pass at least three times across convoluted folds through the double layers of the filter

sheet material, between the open interior space and the space on the other side of the double layers, once forward from the upstream side to the downstream side thereof, through the space between the double layer of filter sheet material, and thence backward through the filter sheet from the downstream side to the upstream side thereof, and then forward through the filter sheet from the upstream side to the downstream side thereof.

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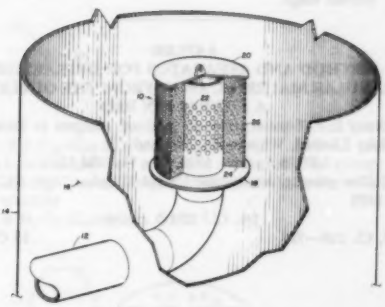
**4,479,875**

## INLET DISTRIBUTOR FOR LIQUID-LIQUID SEPARATORS

**Stephen R. Nelson, Edmond, Okla., assignor to Kerr-McGee Refining Corporation, Oklahoma City, Okla.**

**Filed Aug. 31, 1983, Ser. No. 528,145**
**Int. Cl.³ C02F 17/02**
**U.S. Cl. 210—519** **1 Claim**



1. Apparatus for mounting in a fluid separation zone adapted to improve the gravitational separation of fluids having different densities, said apparatus comprising:

fluid entry means opening into and disposed inwardly of said separation zone,

fluid distribution means mounted upright upon the terminus of said fluid entry means within said separation zone,

said fluid distribution means including: an elongated hollow member in fluid communication with said fluid entry means and having an end plate irremovably mounted upon and closing the terminal end thereof,

another plate mounted about the elongated hollow member in oppositely spaced relation with respect to the end plate,

a plurality of openings through said elongated hollow member transversely spaced along said member between said plates,

packing means disposed annularly about said openings in said elongated hollow member between said plates and

an enveloping open mesh network of interconnecting metal webs operatively enclosing the packing means between said end plates within the fluid distribution means,

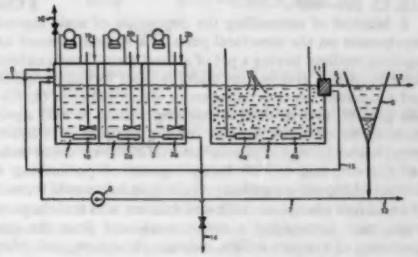
the cross sectional area of the openings in said elongated hollow member being sufficient, with respect to the cross sectional area of said fluid entry means, to reduce the kinetic energy of the fluid entering the separation zone to improve the gravitational separation of the fluid of lower density from the fluid of higher density.

**4,479,876**

## PROCESS AND APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WASTEWATER

**Uwe Fuchs, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany**

**Filed Aug. 9, 1982, Ser. No. 406,624**
**Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3131989**
**Int. Cl.³ C02F 3/30**
**U.S. Cl. 210—605** **11 Claims**



1. A process for the biological purification of wastewater in at least two immediately successive gas treatment stages which comprises: gasifying the wastewater in the presence of activated sludge to conduct biological degradation of organic substrate, withdrawing resultant wastewater activated sludge mixture from the treatment stages and dividing said mixture in a post-clarification stage, into purified water and said activated sludge, and partially recycling the activated sludge into the treatment stages, and further comprising conducting primarily nitrification in the last of said at least two immediately successive treatment stages in the presence of a macroporous carrier material consisting essentially of open-cell polyurethane foam particles having a particle size diameter of 2–50 mm, a specific gravity of 20–200 kg/m³ and open pore size of 0.1–5 mm, with the macroporous carrier material carrying nitrifying bacteria thereon with the bacteria in a concentration on the carrier material of 10–30 g/l, and with primarily organic carbon compound degradation having been conducted in the at least one upstream stage of said at least two immediately successive treatment stages with a feed stream of gas containing a greater proportion of oxygen than air and conducting the organic carbon compound degradation in the at least one upstream stage to an extent such that the $BOD_5$ of the wastewater being passed to the last treatment stage to conduct nitrification therein is at a level of organic pollutants of 10–30 mg/l, treating the wastewater in the nitrification stage with a feed stream of air, and separating the carrier material for nitrifying bacteria from the wastewater-activated sludge mixture exiting from the nitrification stage, and retaining said carrier material in the nitrification stage whereby loss of nitrifying bacteria is avoided by retaining said nitrifying bacteria on said particles.

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**4,479,877**

## REMOVAL OF NITRATE FROM WATER SUPPLIES USING A TRIBUTYL AMINE STRONG BASE ANION EXCHANGE RESIN

**Gerald A. Guter, Bakersfield, Calif., assignor to The United States of America as represented by the Administrator Environmental Protection Agency, Washington, D.C.**

**Filed Jul. 28, 1983, Ser. No. 518,172**
**Int. Cl.³ C02F 1/42**
**U.S. Cl. 210—670** **8 Claims**

1. A method for separating nitrate from a water containing sulfate and less than about 1000 ppm total dissolved solids, said method comprising passing the water through a bed of a particulate, strong-base anion exchange resin, said resin being a tributyl amine derivative of a copolymer of a monovinyl aryl

compound and a polyolefinic cross-linking agent for adsorption of the nitrate onto said resin.

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4,479,878

## HIGH CALCIUM TOLERANT DEPOSIT CONTROL METHOD

Larry W. Becker, Syracuse, N.Y., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 28, 1982, Ser. No. 437,382
Int. Cl.³ C02F 5/14
U.S. Cl. 210—699 6 Claims

1. Method of controlling the deposition of scale imparting precipitates on the structural parts of a system exposed to an aqueous medium having a pH of at least about 7 and containing scale imparting precipitates under deposit forming conditions and a calcium ion concentration of about 400 ppm (as $Ca^{+2}$) and greater, said method comprising adding to said aqueous medium an effective amount for the purpose of 1-hydroxy propylidene-1,1-diphosphonic acid (HPDP) or water soluble salt thereof; said HPDP being capable of performing said control of deposition without resulting in substantial formation of an adduct precipitate with said calcium said scale imparting precipitates comprising a member selected from the group consisting of calcium sulfate, calcium phosphate, and calcium carbonate, and mixtures thereof.

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4,479,879

## PROCESS FOR DEWATERING SLUDGES

Masanori Hashimoto, Yamato, and Masaaki Wakita, Ebina, both of Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed Apr. 11, 1983, Ser. No. 484,089
Claims priority, application Japan, Apr. 22, 1982, 57-67619
Int. Cl.³ C02F 11/14
U.S. Cl. 210—727 6 Claims

1. A process for dewatering an aqueous organic sludge consisting essentially of water and suspended solid particles, which comprises the steps of:

in a first stage, adding to said sludge an amount in the range of 0.3 to 6 wt. %, based on the weight of suspended solids in said sludge, of a synthetic, water-soluble cationic organic flocculant which consists of an A-component and a B-component, wherein said A-component consists of one or more polymers selected from the group consisting of an $A_1$-component and an $A_2$-component, said $A_1$-component being selected from polymers consisting essentially of structural units of vinylimidazoline or partially hydrolyzed products thereof, which $A_1$-component polymers have intrinsic viscosities $[\eta]_{0.1N\text{-}NaCl}^{30^\circ C.}$ of at least 2 dl/g, and said $A_2$-component being selected from Hofmann degradation products of polymers consisting essentially of structural units of acrylamide or methacrylamide, which $A_2$-component polymers have intrinsic viscosities $[\eta]_{0.1N\text{-}NaCl}^{30^\circ C.}$ of at least 1 dl/g, and said B-component consists of one or more polymer components selected from the group consisting of ($B_1$) polymers consisting essentially of structural units of aminoalkylacrylate, aminoalkylmethacrylate, acid addition salts thereof or quaternized products thereof, ($B_2$) Mannich-reaction products of polymers consisting essentially of structural units of acrylamide or methacrylamide, ($B_3$) polyamide-polyamine, ($B_4$) polyethyleneimine, ($B_5$)polymers consisting essentially of structural units of dialkyldiallylammonium salt, ($B_6$) polymers consisting essentially of structural units of aminoalkylacrylamide, aminoalkylmethacrylamide, acid addition salts thereof, or quaternized products thereof, and ($B_7$) polymers consisting essentially of structural units of vinylbenzylalkylamine, which B-component polymers have intrinsic viscosities $[\eta]_{0.1N\text{-}NaCl}^{30^\circ C.}$ of at least 5 dl/g, wherein the proportion by weight of said A-component to said B-component is in range of 4:1 to 1:4, and simultaneously intensely agitating said sludge under conditions effective to neutralize ionic charges of said suspended solid particles and prevent formation of flocs having an average size larger than 2 mm in said sludge;

then, without removing water from said sludge, in a second stage, adding to said neutralized sludge obtained from said first stage 0.2 to 3 wt. %, based on the weight of suspended solids in said neutralized sludge, of a synthetic, water-soluble anionic organic flocculant consisting essentially of polymers having molecular weights of at least 1,000,000, and selected from the group consisting of the following $C_1$ to $C_5$components:

$C_1$ component: Polyacrylic or polymethacrylic acid or salts thereof,

$C_2$ component: Partially hydrolyzed products of polyacrylamide or polymethacrylamide

$C_3$ component: Copolymers of acrylic acid, methacrylic acid or salts thereof with acrylamide or methacrylamide,

$C_4$ component: Copolymers of vinylsulfonic acid salts with acrylamide or methacrylamide,

$C_5$ component: Terpolymers of 2-acrylamido -2methylpropanesulfonic acid salt with acrylic or methacrylic acid salt and acrylamide or methacrylamide, and simultaneously agitating said sludge under milder mixing conditions than those used in said first stage effective to flocculate said sludge to form flocs having a larger floc size than the flocs formed in said first stage, which flocs are non-sticky to the touch; and

then dewatering the flocculated sludge obtained from said second stage.

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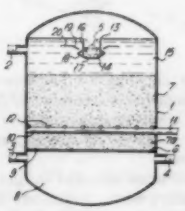
4,479,880

## METHOD AND APPARATUS FOR DEFLECTING GRANULAR MATERIAL AWAY FROM THE OUTLET OF A FILTRATION BED

Anthony I. J. Treanor, Heston, England, assignor to Permutit-Boby Limited, Whitchurch, England

Filed Apr. 13, 1983, Ser. No. 484,821
Claims priority, application United Kingdom, Apr. 21, 1982, 8211493
Int. Cl.³ B01D 23/24
U.S. Cl. 210—795 15 Claims



1. A method in which liquid is filtered through a filter bed of granular material in a vessel and a filter bed is cleaned in a vessel, by simultaneous upflow of wash water and air bubbles; said vessel having an outlet for wash water above the top of the bed, a free water space below the level of the outlet, and at least one baffle in said free water space adjacent to each side of said outlet, each said baffle comprising inner and outer baffle elements inclined upwardly and away from the outlet, an aperture defined by and between the inner and outer baffle elements and an air separation element, said inner element being nearer to said outlet than said outer element, said inner baffle element being positioned to prevent upflow of air through said aperture, said outer element comprising inner and outer edges and said air separation element comprising a substantially horizontal perforated plate extending from said outer edge of said outer element in a direction away from said outlet; wherein the steps of cleaning comprise upflowing water and air through the bed such that some granular material is entrained by upflowing air bubbles, deflecting entrained granular

material adjacent said outlet away from the outlet by said at least one baffle, separating substantially all the entrained granular material from the bubbles adjacent the top of the said water space, separating at least part of the entrained granular material at said perforated plate through which air bubbles may rise but through which the passage of entrained granular material is minimized, and passing any granular material that rises above said at least one baffle down through said aperture, with the separated granular material falling back onto the baffle.

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**4,479,881**

## DETERGENT COMPOSITIONS

**Ho T. Tai, Santes, France, assignor to Lever Brothers Company, New York, N.Y.**

**Filed Feb. 29, 1984, Ser. No. 584,671**

**Claims priority, application United Kingdom, Mar. 10, 1983, 8306645**

**Int. Cl.³ D06M *13/46*; C11D *17/00***

**U.S. Cl. 252—8.8** **10 Claims**

1. A detergent composition for the cleaning and simultaneous softening of fabrics, comprising:

(a) 2–50% by weight of a surfactant selected from the group consisting of anionic and nonionic surfactants and mixtures thereof in conjunction with:

(b) 0.5–15% by weight of a tertiary amine having the general formula:

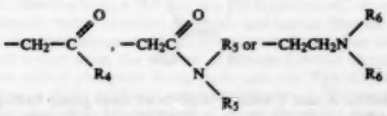
wherein

$R_1$ is a $C_{10}$–$C_{26}$ alkyl or alkenyl group,

$R_2$ is as $R_1$ or, if $R_1$ is a $C_{20}$–$C_{26}$ alkyl or alkenyl group, may be a $C_1$–$C_7$ alkyl group and $R_3$ has the formula $—CH_2—Y$ wherein

Y is H, $C_1$–$C_6$ alkyl,

$—CH_2OH$, $—CH=CH_2$, $—CH_2CH_2OH$, $—CH_2CN$,



wherein $R_4$ is a $C_1$–$C_4$ alkyl group, each $R_5$ is independently H or $C_1$–$C_{20}$ alkyl; and each $R_6$ is independently H or $C_1$–$C_{20}$ alkyl; and

(c) cellulase,

forming together the essential fabric softening ingredients.

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**4,479,882**

## MARINE DIESEL CYLINDER OILS CONTAINING POLYALKOXYLATED PHENOXY COMPOUNDS FOR IMPROVED SPREADABILITY

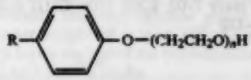
**Benjamin H. Zoleski, Beacon, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 268,954, Jun. 1, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,583**

**Int. Cl.³ C10M *1/40***

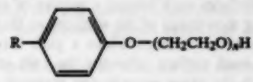
**U.S. Cl. 252—33.4** **2 Claims**

1. A process for improving the spreadability of a diesel engine cylinder mineral oil lubricant having a total base number ranging from about 50 to about 100 due to the presence therein of effective amounts of alkaline detergent-dispersants including overbased calcium sulfonates and carbonates which comprises blending with said lubricant from 0.5 to 2 weight percent thereof of at least one compound represented by the formula:



wherein R is an aliphatic hydrocarbyl group having from 5 to 70 carbon atoms and n is 20.

2. A process for lubricating the moving metal surfaces of a marine diesel engine cylinder which comprises causing a film of a mineral oil having a total base number ranging from about 50 to about 100 due to the presence therein of effective amounts of conventional alkaline detergent-dispersants including overbased calcium sulfonates and carbonates to spread on said surfaces by incorporating in said mineral oil a spreadability improving amount of at least one nonionic detergent represented by the formula:



wherein R is an aliphatic hydrocarbyl group having from 5 to 70 carbon atoms and n is 20.

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**4,479,883**

## LUBRICANT COMPOSITION WITH IMPROVED FRICTION REDUCING PROPERTIES CONTAINING A MIXTURE OF DITHIOCARBAMATES

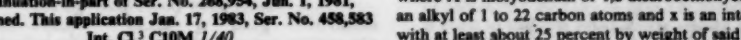
**Harold Shaub, Berkeley Heights, and Barbara J. Schaeffer, Elizabeth, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation of Ser. No. 337,416, Jan. 6, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 582,052**

**Int. Cl.³ C10M *1/48***

**U.S. Cl. 252—32.7 E** **9 Claims**

1. A lubricating oil composition with friction reducing properties comprising a major amount of lubricating oil, from about 0.05 to about 2 parts by weight of an ester of a dicarboxylic acid having from about 9 to about 42 carbon atoms between carboxylic acid groups and a glycol which is selected from the group consisting of alkane diols having from about 2 to about 12 carbon atoms or an oxa-alkane diol having from about 4 to about 200 carbon atoms, and from about 0.1 to about 2 parts by weight of a mixture of molybdenum dithiocarbamate and 1,2 dicarboethoxyethyl dithiocarbamate said dithiocarbamates having the formula:



(I)

where A is molybdenum or 1,2 dicarboethoxyethyl, each R is an alkyl of 1 to 22 carbon atoms and x is an integer of 1 to 3; with at least about 25 percent by weight of said mixture being said molydenum dithiocarbamate; all other weights are based on 100 parts by weight of lubricating oil composition.

**4,479,884**

## DETERGENT BAR PROCESSING

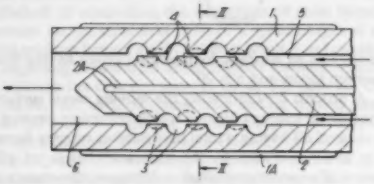
**Terence A. Clarke; Richard B. Edwards, and Graeme N. Irving, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.**

**Continuation of Ser. No. 479,627, Mar. 28, 1983, abandoned. This application Mar. 14, 1984, Ser. No. 587,875**

**Claims priority, application United Kingdom, Mar. 29, 1982, 8209149**

**Int. Cl.³ B01F *7/02*; B29B *1/06*; C11D *9/48, 13/10***

**U.S. Cl. 252—132** **5 Claims**



**1.** The process improving the mush and/or lather properties of superfatted soap-containing detergent material in which the superfatted soap-containing material is subjected to working by passing the material between two closely spaced mutually displaceable surfaces each having a pattern of cavities which overlap during movement of the surfaces so that the material moved between the surfaces traces a path through cavities alternately in each surface, whereby the bulk of the material passes through the shear zone in the material generated by displacement of the surfaces.

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**4,479,885**

## PHTHALONITRILE DERIVATIVES AND A LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

**Akio Mukoh; Teruo Kitamura, both of Ibaraki; Masaharu Kaneko, Kanagawa, and Tetsuo Ozawa, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Mitsubishi Chemical Industries Limited, both of, Japan**

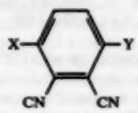
**Filed Feb. 25, 1983, Ser. No. 469,661**

**Claims priority, application Japan, Feb. 25, 1982, 57-29444**

**Int. Cl.³ C09K *3/34*; C07C *121/60***

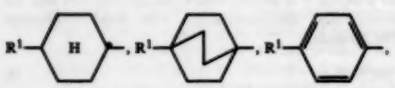
**U.S. Cl. 252—299.62** **7 Claims**

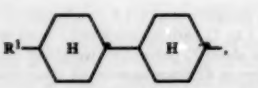
**1.** Phthalonitrile derivatives represented by the formula (I):



(I)

(wherein X and Y each represents an alkyl group having 1 to 9 carbon atoms, an alkoxy group having 1 to 9 carbon atoms,





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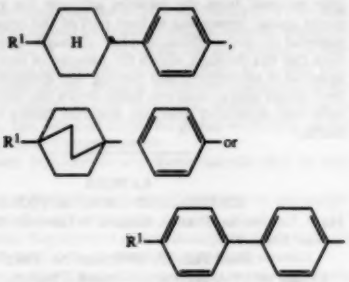
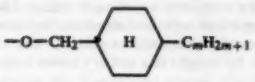
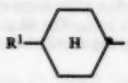


(wherein $R^1$ represents a hydrogen atom, $-C_mH_{2m+1}$, $-O-(CH_2CH_2O)_n-C_mH_{2m+1}$,

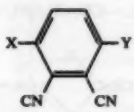


or a halogen atom, wherein m represents an integer of 1 to 9 and n represents 0, 1 or 2), but at least one of X and Y does not represent a methyl group, and Y does not represent an alkyl group having 1 to 9 carbon atoms or an alkoxy group having 1 to 9 carbon atoms in the case that X represents



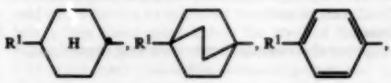
and $R^1$ represents an alkyl group having 1 to 9 carbon atoms).

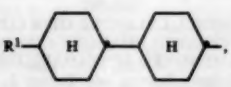
**7.** A liquid crystal composition comprising at least two components, at least one of which is a phthalonitrile derivative represented by the Formula (I):

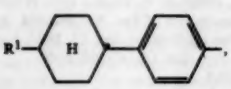


(I)

(wherein X and Y each represents an alkyl group having 1 to 9 carbon atoms, an alkoxy group having 1 to 9 carbon atoms







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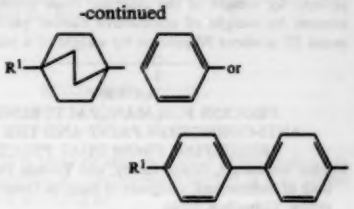
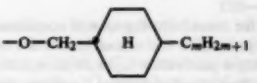
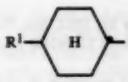


(wherein $R^1$ represents a hydrogen atom, $-C_mH_{2m+1}$, $-O-(CH_2CH_2O)_n-C_mH_{2m+1}$,



or a halogen atom, wherein m represents an integer of 1 to 9 and n represents 0, 1 or 2), but at least one of X and Y does not represent a methyl group, and Y does not represent an alkyl group having 1 to 9 carbon atoms or an alkoxy group having 1 to 9 carbon atoms in the case that X represents



and $R^1$ represents an alkyl group having 1 to 9 carbon atoms).

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**4,479,886**

## METHOD OF MAKING CERIUM ACTIVATED YTTRIUM ALUMINATE PHOSPHOR

**Anthony F. Kasenga, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Aug. 8, 1983, Ser. No. 520,968**

**Int. Cl.³ C09K *11/475***

**U.S. Cl. 252—301.4 R** **1 Claim**

1. The method of making $Y_3Al_5O_{12}$:Ce phosphor comprising the steps of forming a mixture of source materials for $Y_3Al_5O_{12}$:Ce phosphor; firing the mixture at an elevated temperature to react the source materials to form $Y_3Al_5O_{12}$:Ce phosphor; milling the phosphor to reduce the particle size thereof; blending barium fluoride into the milled phosphor; and annealing the blend of milled phosphor and barium fluoride in a reducing atmosphere at a high temperature lower than said elevated temperature, the amount of barium fluoride blended into the milled phosphor being such that the $Y_3Al_5O_{12}$:Ce phosphor so made exhibits a greater brightness at 3650 excitation than said phosphor prepared as above absent the steps of milling the phosphor, blending barium fluoride into the milled phosphor and annealing the blend in a reducing atmosphere at said high temperature.

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**4,479,887**

## POLYETHER DERIVATIVES, THEIR USE AS EMULSIFIERS, AND EMULSIONS CONTAINING THE NEW POLYETHER DERIVATIVE

**Karl Seibert, Dueren-Niederau, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.**

**Filed Feb. 28, 1983, Ser. No. 470,900**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207612**

**Int. Cl.³ B01J *13/00*; B01F *17/42***

**U.S. Cl. 252—309** **16 Claims**

1. A polyether derivative prepared by gradual addition of a long-chain aliphatic 1,2-epoxy with a chain length of 10 to 32 carbon atoms, at temperatures from 100° to 200° C., to an alcohol ethoxylate, in the presence of 0.1 to 1% by weight of alkali hydroxide, based on the total quantity of said 1,2-epoxy and said alcohol ethoxylate, said alcohol ethoxylate being either (1) a polyethylene glycol monoalkylether, the average molecular weight of which amounts to 400 to 2500 and the alkyl group of which contains 1 to 3 carbon atoms; or (2) a polyethylene glycol-polypropylene glycol monoalkylether with an average molecular weight of 450 to 3100, the repeating ethylene oxide and propylene oxide units of which form one block each, whereby the polypropylene glycol block has an average molecular weight of at most 600 and the alkylether group of which forms the end of the polyethylene glycol block and contains 1 to 3 carbon atoms.

5. An oil-in-water or water-in-oil emulsion, wherein said emulsion is emulsified by an emulsifier, said emulsifier being a polyether derivative prepared by gradual addition of a long-chain aliphatic 1,2-epoxy with a chain length of 10 to 32 carbon atoms, at temperatures from 100° to 200° C. in the presence of 0.1 to 1% by weight of alkali hydroxide, based on the total quantity of the initial materials, to either (1) a polyethylene glycol monoalkylether, the average molecular weight of which amounts to 400 to 2500 and the alkyl group of which contains 1 to 3 carbon atoms; or to (2) a polyethylene glycol-polypropylene glycol monoalkylether with an average molecular weight of 450 to 3100, the repeating ethylene oxide and propylene oxide units of which form one block each, whereby the polypropylene glycol block has an average molecular weight of at most 600 and the alkylether group of which forms the end of the polyethylene glycol block and contains 1 to 3 carbon atoms.

9. A water-in-oil emulsion, wherein said emulsion is emulsified by an emulsifier, said emulsifier being a polyether derivative prepared by gradual addition of a long-chain aliphatic 1,2-epoxy with a chain length of 10 to 32 carbon atoms, at temperatures from 100° to 200° C. in the presence of 0.1 to 1% by weight of alkali hydroxide, based on the total quantity of the initial materials, to either (1) a polyethylene glycol monoalkylether, the average molecular weight of which amounts to 400 to 2500 and the alkyl group of which contains 1 to 3 carbon atoms; or to (2) a polyethylene glycol-polypropylene glycol monoalkylether with an average molecular weight of 450 to 3100, the repeating ethylene oxide and propylene oxide units of which form one block each, whereby the polypropylene glycol has an verage molecular weight of at most 600 and the alkylether group of which forms the end of the polyethylene glycol block and contains 1 to 3 carbon atoms.

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**4,479,888**

## DISPERSING ADDITIVES FOR LUBRICANTS, AND THE METHOD FOR THEIR PREPARATION

**Paolo Koch, San Giuliano Milanese; Luciano Mattei, and Giampaolo Gerbaz, both of Milan, all of Italy, assignors to Agip Petroli S.p.A., Rome, Italy**

**Filed Jun. 4, 1980, Ser. No. 156,427**

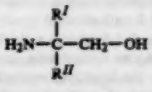
**Claims priority, application Italy, Aug. 10, 1979, 25049 A/79**

**Int. Cl.³ B01F *17/16***

**U.S. Cl. 252—357** **2 Claims**

1. A process for preparing dispersing additives for mineral or synthetic lubricants, comprising the steps of:

(a) reacting one or more amino alcohols of the formula:



wherein $R^I$ is $-CH_2OH$ and $R^{II}$ is hydrogen, a branched or unbranched alkyl having from 1 to 10 carbon atoms, or is equal to $R^I$, with an equimolar amount of a saturated monocarboxylic acid of the formula:

$R^{III}COOH$

wherein $R^{III}$ is a branched or unbranched alkyl having from 1 to 49 carbon atoms; and

(b) reacting the product of step (a) with a polyisobutenylsuccinic anhydride carrying a hydrocarbon chain having from 50 to 500 carbon atoms, or with a saturated monocarboxylic acid of the formula:

$R^{III}COOH$

wherein $R^{III}$ is as hereinbefore defined.

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4,479,889

## COMPOSITIONS AND METHOD FOR DEGRADING FOODSTUFFS

Vincent J. DiPaola, Elkton; William H. Collins, Timonium, both of Md., and Louis M. Sherman, Ocean City, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1968, Ser. No. 766,333
Int. Cl.³ C09K 3/00
U.S. Cl. 252—365 7 Claims

1. A composition for degrading foodstuffs which consists essentially of the following components in the percent by weight indicated:

(a) a physiological agent selected from the group consisting of a podophyllum resin, croton oil, emetine hydrochloride, ergot, ergonovine maleate, ergotamine tartrate and d-Lysergic acid diethylamide and a mixture thereof, in an amount in the range of about 1 to 50 percent,

(b) benzyl diethyl ammonium benzoate in an amount in the range of about 5 to 20 percent,

(c) a malodorant selected from the group consisting of a mercaptan and a fatty acid having a chain of about 5 to 12 carbon atoms in an amount in the range of 0.0 to 5.0 percent,

(d) a dye selected from the group consisting of fuchsin, methylene blue, indigo carmine and calco red in an amount in the range of 0.5 to 5.0 percent, and

(e) a solvent vehicle in an amount in the range of 50 to 90 percent.

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4,479,890

## THICK FILM RESISTOR INKS

Ashok N. Prabhu, Plainsboro, N.J., and Simon M. Boardman, Holland, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1982, Ser. No. 432,973
Int. Cl.³ H01B 1/06
U.S. Cl. 252—508 10 Claims

1. In a process of terminating a thick film resistor to a copper foil conductor on a circuit board comprising:

(a) applying directly to selected sites on the copper conductor a thick film resistor ink composition comprising an epoxy resin, alumina conductive carbon particles and a suitable solvent; and

(b) curing the ink composition by heating to a temperature between about 100° and 250° for from 15 to 120 minutes thereby forming a thick film resistor,

the improvement wherein said ink composition contains particulate alumina having an average particle size of from above about 0.5 micrometer to about 5.0 micrometers, and the weight percent ratio of the particulate alumina to the epoxy resin is between about 1:1 and about 2:1.

8. In an ink composition suitable for forming a thick film resistor on a circuit board comprising an epoxy resin, conductive particles and a suitable solvent, the improvement wherein said ink contains a sufficient amount of particulate alumina having an average particle size of from above about 0.5 micrometer to about 5.0 micrometers so that the ink can be applied directly to a copper foil conductor on the board, the weight ratio of the alumina to the epoxy resin being between about 1:1 and 1:2, said ink comprising: from about 20 to about 30 percent by weight of said resin; from about 30 to about 40 percent by weight of the alumina, from about 1 to about 7 percent by weight of conductive carbon particle and from about 25 to about 50 percent by weight of a suitable solvent.

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4,479,891

## PROCESS FOR MANUFACTURING AN ANTI-CORROSION PAINT AND THE PAINT RESULTING FROM THAT PROCESS

Michel Kornmann, Grand-Lancy, and Yehuda Talmor, Geneva, both of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jun. 8, 1983, Ser. No. 502,206
Claims priority, application Switzerland, Jun. 10, 1982, 3581/82
Int. Cl.³ C08K 3/32, 3/10
U.S. Cl. 252—512 5 Claims

1. Process for manufacturing an anti-corrosion paint providing cathodic protection and whose binder is a resin characterized in forming a passivation layer of phosphate and/or chromate salts on the surface of manganese pigments and thereafter incorporating said pigments in said resin.

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4,479,892

## AG-METAL OXIDES ELECTRICAL CONTACT MATERIALS

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Filed May 16, 1983, Ser. No. 494,970
Int. Cl.³ H01B 1/02
U.S. Cl. 252—514 2 Claims

1. Electrical contact materials of a silver base having dispersed in their silver matrices 2 to 20 weight % of fine oxide grains of a metal selected from the group consisting of Sn, Sb, Zn, In, Cd and Bi and mixtures thereof, and having thereon contact surfaces each of which has secured thereon a layer of precious metal selected from the group consisting of gold, palladium, or alloys thereof, each said layer having been diffused under pressure and at a temperature below its melting point and in solid phase into the contact materials so that the precious metal layers extend through said contact surfaces to moderate depths of the associated contact materials, gradually reducing in density as the depth of diffusion increases, and occupying about 20–100 weight % of the contact surfaces of said materials.

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4,479,893

## SHAMPOO COMPOSITION CONTAINING PHOSPHORIC ACID ESTER AND ORGANIC SILICON DERIVATIVE

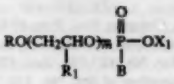
Hajime Hirota, Tokyo, and Hiroshi Watanabe, Funabashi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,361
Claims priority, application Japan, Oct. 28, 1981, 56-172460
Int. Cl.³ C11D 1/16, 1/82, 1/83
U.S. Cl. 252—542 6 Claims

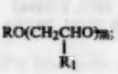
1. A hair shampoo composition consisting essentially of an aqueous shampoo base consisting essentially of 10 to 25 wt.% of one or a mixture of two or more surface active agents selected from the group consisting of straight-chain or branched-chain alkylsulfuric acid ester salts of 10 to 16 carbon atoms, polyoxyethylene alkylsulfuric acid ester salts having an average ethylene oxide addition mol number in the range of 0.5–8 in which the alkyl group has 8 to 20 carbon atoms on the average, olefinsulfonic acid salts of 10 to 16 carbon atoms on the average, higher fatty acid mono- and di-alkanolamides having an alkyl group of 10 to 14 carbon atoms on the average, alkyl amine oxides, alkyl betaines and imidazolines having 10 to 14 carbon atoms on the average, said agents being effective for washing hair, and the balance is essentially water, said shampoo base having incorporated therein

(A) 0.1 to 5.0 wt.%, based on the total weight of the sham-

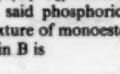
poo composition, of at least one anionic phosphoric acid ester having the formula



in which R is linear or branched alkyl group having 8 to 22 carbon atoms; $R_1$ is hydrogen or methyl; m is an integer of 0 to 6; B is $—OX_2$ or

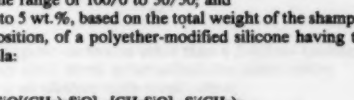


and $X_1$ and $X_2$, which can be the same or different, are hydrogen, alkali metal, alkyl($C_1$–$C_3$)-substituted ammonium, hydroxyalkyl($C_1$–$C_3$)-containing alkanolamine or a basic amino acid, said phosphoric acid ester consisting essentially of a mixture of monoester wherein B is $—OX_2$ and diester wherein B is



such that the weight ratio of said monoester to said diester is in the range of 100/0 to 50/50; and

(B) 0.01 to 5 wt.%, based on the total weight of the shampoo composition, of a polyether-modified silicone having the formula:



wherein A' is alkyl of 1 to 12 carbon atoms or hydrogen, $x_1$ is an integer of from 1 to 100, $y_1$ is an integer of from 1 to 50, $m_2$ is an integer of 1 to 50 and $n_2$ is an integer of 0 to 50, with the proviso that the sum of $x_1$ and $y_1$ is at least 15 and the sum of $m_2$ and $n_2$ is at least 5.

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**4,479,894**

## OIL RECOVERY BY SURFACTANT-ALCOHOL WATERFLOODING

**Catherine S. H. Chen, Berkeley Heights, N.J., and Yuhshi Luh, Monroeville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 232,474, Feb. 9, 1981, Pat. No. 4,370,243. This application Jun. 23, 1982, Ser. No. 391,213**

**The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.**

**Int. Cl.³ E21B *43/22***

**U.S. Cl. 252—8.55 D** **15 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid having a salinity of at least 5 percent by weight and a divalent metal ion concentration of at least 0.5 percent by weight is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing in said fluid the following:

(a) a mixture of a sulfobetaine surfactant and a preferentially oil-soluble aliphatic alcohol cosurfactant, said surfactant and cosurfactant being present in said fluid in amounts sufficient to lower the interfacial tension of water in said fluid and oil in said reservoir;

(b) a thickening agent which is a quaternary ammonium compound containing at least one hydrocarbyl group having 16 to 20 carbon atoms, said thickening agent being present in said fluid in an amount sufficient to achieve a viscosity of at least a portion of said fluid of about 1 to 4 times the viscosity of the reservoir oil; and

(c) a sacrificial agent which is an organic quaternary ammonium compound wherein the organic groups are alkyl groups containing 1 to 4 carbon atoms, said sacrificial agent being present in said fluid in an amount sufficient to reduce loss of said surfactant and said thickening agent in said reservoir.

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**4,479,895**

## IMMUNOGLOBULIN HALF-MOLECULES AND PROCESS FOR PRODUCING HYBRID ANTIBODIES

**Karen Auditore-Hargreaves, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 5, 1982, Ser. No. 374,971**

**Int. Cl.³ C07G *7/00*; A61K *39/395***

**U.S. Cl. 260—112 B** **15 Claims**

1. A substantially pure immunoglobulin heavy chain-light chain half-molecule having the structure R—S—X, where R is $H_1L_1$ and X is $SO_3^-$.

6. A process for preparing S-sulfonated immunoglobulin half-molecules by selectively cleaving an immunoglobulin molecule into its heavy chain-light half-molecules by sulfitolysis of the interheavy chain disulfide linkage; wherein the sulfitolysis reaction comprises the steps of:

(A) mixing an immunoglobulin molecule with sodium sulfite and 5,5'-dithiobis(2-nitrobenzoic acid);

(B) incubating in a nonoxidizing atmosphere; and

(C) separating the protein products.

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**4,479,896**

## METHOD FOR EXTRACTION LOCALIZATION AND DIRECT RECOVERY OF PLATELET DERIVED GROWTH FACTOR

**Harry N. Antoniades, 21 Magnolia Ave., Newton, Mass. 02158**

**Continuation of Ser. No. 329,668, Dec. 11, 1981, abandoned. This application Jul. 8, 1983, Ser. No. 512,315**

**Int. Cl.³ C07G *7/00***

**U.S. Cl. 260—112 B** **12 Claims**

1. A process for extracting Platelet Derived Growth Factor from an aqueous suspension of platelets comprising the steps of:

precipitating the polypeptide fraction comprising the Platelet Derived Growth Factor from the internal contents of the platelets;

separating said polypeptide fraction comprising the Platelet Derived Growth Factor from said precipitant;

purifying the Platelet Derived Growth Factor in said polypeptide fraction to homogenity;

isolating said Platelet Derived Growth Factor using means for gel electrophoresis whereby said Platelet Derived Growth Factor is isolated as at least one localized band within said gel means after electrophoresis;

staining said localized band of Platelet Derived Growth Factor in said gel electrophoresis means with dye reagent means, whereby said isolated band becomes a biologically active chromophore visibly distinguishable from said gel electrophoresis means;

excising said chromophoric biologically active Platelet Derived Growth Factor from said gel electrophoresis means as a gel slice; and

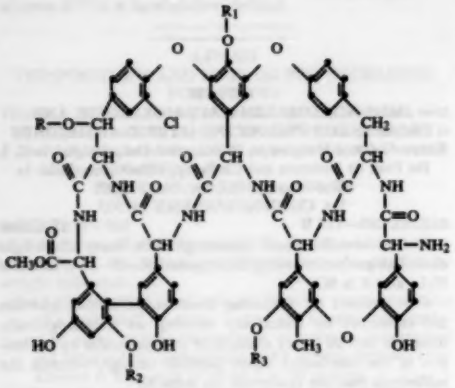
eluting said chromophoric Platelet Derived Growth Factor from said excised gel slice.

## 4,479,897
## ACTAPLANIN ANTIBIOTICS

Ann H. Hunt, Greenwood, and Kurt E. Merkel, Mooresville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 27, 1983, Ser. No. 488,967
Int. Cl.³ C07C *103/52*; C07H *17/08*
U.S. Cl. 260—112.5 R 10 Claims

1. A compound of the formula



wherein R is L-ristosamine;

$R_1$ is hydrogen, glucosyl, or the disaccharide mannosyl-glucose or rhamnosyl-glucose;

$R_2$ and $R_3$ independently are hydrogen or mannose; with the limitations that when $R_1$ is hydrogen, either or both of $R_2$ and $R_3$ is or are mannose; when $R_1$ is glucosyl, $R_2$ and $R_3$ are both hydrogen; and when $R_1$ is a disaccharide, $R_2$ is hydrogen; and the pharmaceutically acceptable non-toxic salts thereof.

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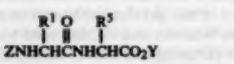
## 4,479,898
## OLIGOPEPTIDE PRODRUGS

Charles Gilvarg, Princeton, N.J., and William D. Kingsbury, King of Prussia, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 507,326, Jun. 23, 1983, Pat. No. 4,454,065, which is a continuation-in-part of Ser. No. 379,537, May 18, 1982, abandoned. This application Feb. 29, 1984, Ser. No. 584,572
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 10 Claims

1. A compound of the structural formula:



in which:

Y is a carboxyl protective group;

$R^1$ is a $C_{1-4}$ lower alkyl, phenyl, Z—$NHC_3H_6$—, or benzyl;

$R^5$ is chloro, bromo, hydroxy or acyloxy; and

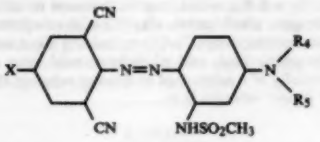
Z is an amino-protective group.

## 4,479,899
## RED DYEING 2,6-DICYANO-2'-SULFONAMIDO-4'-AMINO-AZO-BENZENES

Rainer Hamprecht, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 112,995, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 110,731, Jan. 9, 1980, abandoned, which is a continuation of Ser. No. 884,954, Mar. 9, 1978, abandoned. This application Mar. 1, 1983, Ser. No. 470,080
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711130; Sep. 3, 1977, 2739842
Int. Cl.³ C09B *29/01, 29/036, 29/085, 29/09*
U.S. Cl. 260—205 2 Claims

1. A red-dyeing azo compound of the formula



wherein

X is H, Cl, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy and

$R_4$ and $R_5$ are each ethyl or ethyl substituted by —COOH or —$OCOCH_3$.

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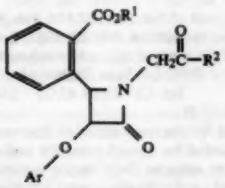
## 4,479,900
## 1-CARBALKOXYALKYL-3-ARYLOXY-4-(2'-CARBOXY-PHENYL)-AZETIDIN-2-ONES

Tatao Luo, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 29, 1983, Ser. No. 490,065
Int. Cl.³ C07D *205/08*; A01N *43/44*; C07C *119/10, 69/65*
U.S. Cl. 260—239 A 14 Claims

1. A compound of the formula:



wherein $R^1$ is lower alkyl or benzyl; $R^2$ is lower alkoxy, benzyloxy or the group

where $R^3$ is lower alkoxy; and Ar is phenyl optionally substituted with 1 to 3 substituents independently selected from halogen, trihalomethyl, nitro and lower alkyl.

4,479,901

## FLUORINATION OF CARBANIONS WITH N-FLUORO-N-ALKYLSULFONAMIDES

William E. Barnette, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1983, Ser. No. 523,356
Int. Cl.³ C07D 243/26; C07C 69/76, 69/38, 55/08, 55/02, 39/38, 43/225
U.S. Cl. 260—239 BD 16 Claims

1. Process for fluorinating an organic carbanion, which process comprises contacting and reacting, in a dry inert atmosphere, the compound of the formula selected from

$$\overset{\ominus\oplus}{R^2M} \quad \text{and} \quad \overset{\ominus}{R^2M}\overset{+2}{\quad}\overset{\ominus}{X}$$

and the N-fluoro-N-alkylsulfonamide of the formula

$$RSO_2N(F)-R^1$$

wherein

R is $C_{1-30}$ branched or straight chain alkyl, $C_{3-30}$ cycloalkyl, ar($C_{1-10}$ alkyl) or aryl wherein ar and aryl are $C_{6-14}$;

$R^1$ is $C_{1-30}$ branched or straight chain alkyl, $C_{3-30}$ cycloalkyl or ar($C_{1-10}$ alkyl) wherein ar is $C_{6-14}$;

$$\overset{\ominus}{R^2}$$

is an organic carbanion other than a $\beta$-diketo enolate;

$M^{\oplus}$ is an alkali metal or tetraalkylammonium cation;

$M^{+2}$ is an alkaline earth metal cation;

$X^{\ominus}$ is fluoride, chloride, bromide or iodide; and

F is $^{19}F$ or $^{18}F$.

13. N-Fluoro-N-neopentyl-p-toluenesulfonamide.

14. N-Fluoro-N-(exo-2-norbornyl)-p-toluenesulfonamide.

15. N-Fluoro-N-(endo-2-norbornyl)-p-toluenesulfonamide.

16. N-Fluoro-N-neopentyl-n-butylsulfonamide.

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4,479,902

## SELECTIVE REDUCTION OF EDIBLE FATS AND OILS; PLATINUM AND PALLADIUM ON TITANIA

Bruce I. Rosen, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 3, 1982, Ser. No. 404,724
The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.
Int. Cl.³ C11C 3/12
U.S. Cl. 260—409 10 Claims

1. A method for the selective reduction of the polyenic components of a fatty material comprising contacting under hydrogenation conditions the fatty material with hydrogen and a catalyst which consisting essentially of zerovalent platinum or palladium dispersed on a support selected from the group consisting of $TiO_2$, $Ta_2O_5$, $V_2O_5$, and $Nb_2O_5$, said catalyst having been activated in hydrogen at a temperature from about 325° to about 600° C., and recovering the selectively reduced product.

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4,479,903

## PROCESS FOR THE PREPARATION OF N-ALLYL-O-ALKYL THIONOCARBAMATES

David L. Dauplaise, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 23, 1982, Ser. No. 410,687
Int. Cl.³ C07C 155/02
U.S. Cl. 260—455 A 10 Claims

1. A process for the preparation of N-allyl-O-alkyl thionocarbamates, comprising:

(a) reacting, in the presence of a phase transfer catalyst, an alkali metal or ammonium cyanide, sulfur, and an allyl halide in water as the reaction solvent to produce a reaction mixture comprising an organic phase containing an allyl isothiocyanate and an aqueous phase;

(b) separating said aqueous phase from said organic phase; and

(c) reacting said allyl isothiocyanate with an alcohol in the presence of a catalyst useful for the production of urethanes to produce said N-allyl-O-alkyl thionocarbamate.

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4,479,904

## REDUCTION OF NITROAROMATIC COMPOUNDS

Kenneth C. Lilje, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 20, 1983, Ser. No. 506,236
Int. Cl.³ C07C 121/78
U.S. Cl. 260—465 E 17 Claims

15. In a process for preparing 2-(4-amino-3-fluorobenzene)-propionitrile by (a) reacting 2-fluoronitrobenzene with 2-chloropropionitrile in an inert solvent and in the presence of a base and (b) reducing the 2-(3-fluoro-4-nitrobenzene)propionitrile thus obtained, the improvement which comprises:

(1) isolating the crude reaction product of the 2-fluoronitrobenzene/2-chloropropionitrile reaction and

(2) subjecting that product to reduction in the presence of active iron powder and an aqueous alkanol.

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4,479,905

## NITRATION PROCESS

Gordon G. Knapp; Marguerite S. Baylerian, and Paul D. Seemuth, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 19, 1983, Ser. No. 533,223
Int. Cl.³ C07C 77/02
U.S. Cl. 260—467 10 Claims

1. Continuous process for making an organic nitrate mixture containing a substantial amount of an alkoxyalkyl nitrate, said process comprising:

(A) forming an alcohol mixture of (i) about 50–95 wt % of a primary alcohol containing 4 to about 12 carbon atoms and (ii) about 5–50 wt % of an alkoxyalkanol having the structure

$$R'-O-R''-_nOH$$

wherein R′ is an alkyl group containing 1–12 carbon atoms, R″ is a divalent aliphatic hydrocarbon group containing 2–4 carbon atoms and n is an integer from 1–4;

(B) forming an acid mixture consisting essentially of about 10–25 weight percent $HNO_3$ and 50–75 weight percent $H_2SO_4$, the balance being water;

(C) concurrently feeding said alcohol mixture and said acid mixture to a reaction zone forming a nitration mixture, said feeding being at a ratio such that (i) the moles of $HNO_3$ is at least 1.05 times the combined moles of said primary alcohol and said alkoxyalcohol in said alcohol mixture fed to said reaction zone and (ii) the moles of $H_2SO_4$ is at least 0.55 times the total moles of water, said primary alcohol and said alkoxyalcohol in the combined alcohol mixture—acid mixture feed, said feeding being at a rate which provides an average residence time in said reaction zone of about 3–10 minutes, said nitration mixture being maintained at a temperature of about −10° C. to 15° C.;

(D) removing said nitration mixture from said reaction zone at a rate which maintains a substantially constant nitration mixture volume in said reaction zone;

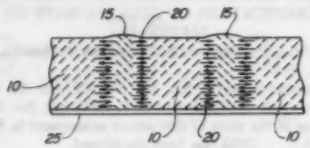
(E) separating an organic nitrate mixture from said organic nitrate mixture containing a substantial amount of an alkoxyalkyl nitrate.

4,479,913

## METHOD AND COMPOSITION FOR A RAMMING MIX IN ALUMINUM REDUCTION CELLS

Denis W. Akerberg, Huntley, and Carl A. Rude, Cary, both of Ill., assignors to QO Chemicals, Inc., Chicago, Ill.

Continuation of Ser. No. 244,370, Mar. 16, 1981, abandoned.
This application Feb. 18, 1983, Ser. No. 467,984
Int. Cl.³ B29C 25/00
U.S. Cl. 264—29.5 5 Claims




1. A method for joining adjacent carbon blocks with a high temperature polymerizable ramming mix, wherein the mix is rammed at ambient temperature between the adjacent blocks, comprising the steps of:

a. preparing the high temperature polymerizable ramming mix by admixing, at ambient temperature: approximately 80–85 percent calcined anthracite: approximately 10–20 percent of a binder capable of carbonizing to over 40 percent carbon content based on the weight of the binder; approximately 5–10 percent monomeric furfuryl alcohol; and a catalytic amount of a heat activated polymerizing catalyst;

b. ramming said ramming mix at ambient temperature between said adjacent carbon blocks;

c. allowing the monomeric furfuryl alcohol to penetrate into said adjacent carbon blocks; and

d. baking said carbon blocks to cure the binder material, wherein the temperature is slowly raised to a temperature at which the binder material carbonizes;

whereby the carbonized binder provides a strong carbon-carbon bond with said adjacent carbon blocks.

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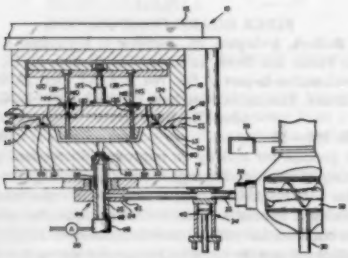
4,479,914

## PROCESS AND MOLD FOR MOLDING FOAMED PLASTIC ARTICLES

Ervin J. Baumrucker, Highlands, N.C., assignor to Cashiers Plastics, Portland, Oreg.

Filed Nov. 1, 1982, Ser. No. 438,377
Int. Cl.³ B29D 27/00
U.S. Cl. 264—45.5 9 Claims



1. A method of molding foamed articles by injecting a molten synthetic resin material with a foaming agent contained therein from an injection means, including one or more nozzle means, into a cavity of a mold means, the method comprising the steps of:

closing the mold means;

prepressurizing the mold cavity with gas so as to substantially prevent diffusion of the blowing gas produced from the foaming agent;

injecting an amount of molten synthetic resin material containing a foaming agent into the cavity, the amount being insufficient to fill the cavity;

venting a portion of the prepressurization gas from the mold cavity through a discharge port during the injection step while maintaining the pressure within the mold cavity at a level which substantially prevents diffusion of the blowing gas produced from the foaming agent;

venting the remaining prepressurization gas and blowing gas from the mold cavity to a vacuum chamber means following the completion of the injection step so as to allow expansion of the injected foamable resin material within the mold cavity, the vacuum drawing the resin material throughout the mold cavity;

solidifying the molded article; and

ejecting the article from the mold means.

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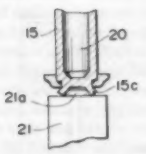
4,479,915

## FLOAT STOPPER ATTACHING METHOD IN LIQUID LEVEL SENSOR

Kaoru Tsubouchi, and Akira Funahashi, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 26, 1982, Ser. No. 352,994
Claims priority, application Japan, Mar. 5, 1981, 56-31780
Int. Cl.³ B29C 17/00, 27/00; B29F 5/00
U.S. Cl. 264—249 2 Claims




1. A method of attaching a float stopper in a liquid level sensor of the type which comprises a switch case made of a thermoplastic resin, so disposed in a tank as to extend in the vertical direction, with one end thereof being fixed and the other end free, a switch, actuated by a magnetic force, disposed within said switch case, a float fitted over the outside of said switch case so as to be freely slidable in the vertical direction, a permanent magnet attached to said float, and the float stopper attached to the free end of said switch case for limiting the vertical stroke of said float at said free end of the switch case, which method comprises the steps of:

forming the free end of the switch case into a hollow, cylindrically shaped caulking projection;

forming a hole in the center of the float stopper to such a diameter as permits the float stopper to be fitted over the outer periphery of the caulking projection and so that the rim of the central hole forms an angle of about 90° with the bottom surface of the hole stopper;

fitting the float stopper over the outer periphery of the caulking projection, the tip of the caulking projection passing through and emerging from the hole;

heating a caulking tool to a temperature which is lower than the melting point of the thermoplastic resin constituting the switch case, a portion of said heated caulking tool having the shape of a truncated cone;

forcibly inserting said portion of the heated caulking tool into the emerging tip of the hollow, cylindrically shaped caulking projection to heat said caulking projection to a temperature which is lower than the melting point of the thermoplastic resin; and

spreading the heated tip of the caulking projection by means of the caulking tool until the outer peripheral surface of

the caulking projection comes into abutting pressured contact with the rim of the hole formed in the float stopper and the extremity of the caulking projection is caulked into the truncated cone shape.

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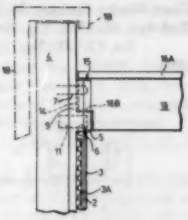
## 4,479,916
## METHOD OF MAKING A BUILDING PANEL

**John M. A. Blatchford, "Linden Lea", Norton Hill, Midsomer Norton, Bath, Avon, England, assignor to John M. A. Blatchford, Bath, England**

**Filed Feb. 12, 1982, Ser. No. 348,318**
**Claims priority, application United Kingdom, Feb. 13, 1981, 8104617**
**Int. Cl.³ B29D *3/00*; B29H *9/00***
**U.S. Cl. 264—263** **14 Claims**



1. A method of making a building panel which panel comprises a first reinforced concrete layer having first and second ends; a second reinforced concrete layer having first and second ends; a layer of thermal insulating material between the first and second concrete layers; and prestressing strands extending within the first concrete layer, the method comprising the steps of:

(a) casting the first concrete layer on a surface so as to embed the prestressing strands with ends projecting from the ends of the first concrete layer;

(b) casting the second concrete layer on a surface in such manner as to be longer than the first concrete layer thereby providing two end portions of the second concrete layer;

(c) placing a layer of thermal insulating material on the cast second concrete layer;

(d) placing the first concrete layer over the layer of thermal insulating material with the projecting ends of the prestressing strands extending over the two end portions of the second concrete layer; and

(e) casting concrete portions on the two end portions of the second concrete layer in such manner as to embed the projecting ends of the prestressing strands of the first concrete layer and to provide an expansion gap between at least one end of the first concrete layer and a respective said concrete portion of the second layer.

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## 4,479,917
## USE OF AMINOGUANIDINE COMPOUNDS AS OXYGEN-SCAVENGING AND CORROSION-INHIBITING AGENTS

**Eugene F. Rothgery, North Branford, and Steven A. Manke, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Nov. 14, 1983, Ser. No. 551,235**
**Int. Cl.³ C23F *11/04***
**U.S. Cl. 422—16** **11 Claims**

1. A method for scavenging oxygen and for protecting metal surfaces against corrosion caused by contact of an oxygen-containing fluid therewith comprising adding an effective amount of an aminoguanidine compound to scavenge at least a portion of the oxygen contained therein and to inhibit corrosion on the metal surfaces in contact therewith; said aminoguanidine compound selected from the formula



or a salt thereof; wherein R is selected from H or a lower alkyl group having 1 to 4 carbon atoms; wherein X is selected from NH or $NNH_2$; and Y is selected from $—NH_2$ or $—NHNH_2$.

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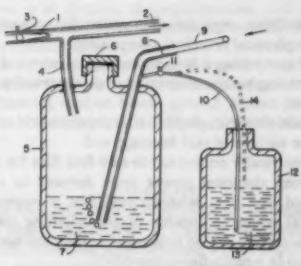
## 4,479,918
## APPARATUS FOR SAFELY GENERATING AND DISPENSING A GAS

**Raymond W. Hoeppel, P.O. Box 997, Oak View, Calif. 93022**

**Continuation-in-part of Ser. No. 189,803, Sep. 22, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,242**
**Int. Cl.³ B01J *4/00*, *10/00*, *19/26***
**U.S. Cl. 422—112** **7 Claims**



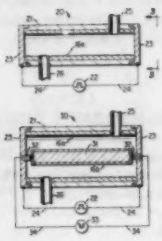
1. Apparatus for safely generating and dispensing a gas, said gas being generated by chemical reaction of a first given liquid reactant with at least one other second given reactant in aqueous solution; said apparatus comprising a reactor with a gas tight closure for holding said second given reactant, said reactor being connected with vacuum tubing from an outlet in its upper area, above the level of liquid in the reactor, to the inlet of a vacuum pump; means for conducting atmospheric air to a point below the surface of the solution of said second given reactant inside of said reactor, said air bubbling through and stirring said solution in the reactor when the reactor is evacuated; a container for holding said first given liquid reactant under atmospheric pressure; delivery tubing for slowly transferring said first given liquid reactant into said reactor, at least a portion of said delivery tubing being of restricted cross section, said delivery tubing being in contact with said first given liquid reactant at the intake end and connected to an enlarged evacuated area within said reactor at the discharge end so that syphoning is prevented when vacuum is absent, said delivery tubing restricting the flow rate of said first given liquid reactant to such value that the resultant reaction, when said first and second given reactants contact each other will produce a temperature rise within said reactor that will remain below the boiling point of solution in the reactor and will produce gas at a lesser rate than the rate of removal of gas by said vacuum pump; means for connecting the discharge end of said delivery tubing to said air conduoting means, thus assuring that said first given liquid reactant will be mechanically dispersed into said aqueous solution of said second given reactant via air bubbling through said aqueous solution; said reaction occuring when said first given reactant is sucked into the reactor through said delivery tubing, producing a gas when it contacts said second given reactant, the gas being removed from the reactor by the vacuum pump and dispensed through the discharge side of said vacuum pump.

4,479,919

## MULTIPLE FIRING EXPLODING FILM SYSTEMS

Frank E. Lowther, Chatsworth, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1982, Ser. No. 454,506
Int. Cl.³ B01J 3/08, 19/02
U.S. Cl. 422—127 9 Claims



1. A multi-firing, exploding film system for enhancing chemical and/or physical reactions comprising:

a reactor comprising a housing having an inlet and an outlet, said housing being constructed of an electrically insulative material;

a first multi-firing, explodible film deposited on at least one interior surface of said housing; and

means electrically connected to said first film for cyclically supplying electrical power upon demand to repeatably fire said first film, wherein said film is composed of a material which is capable of recondensing on the said interior surface of said housing after said film has exploded to provide a multi-firing capability.

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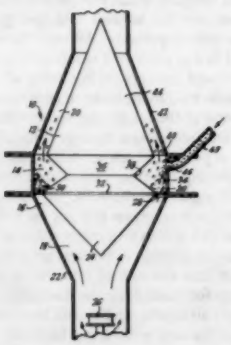
4,479,920

## APPARATUS FOR PROCESSING MATTER IN A TURBULENT MASS OF PARTICULATE MATERIAL

Christopher E. Dodson, Reading, England, assignor to Torftech Limited, London, England

Filed Jun. 24, 1982, Ser. No. 391,927
Claims priority, application United Kingdom, Jun. 29, 1981, 8119977; Jan. 6, 1982, 8200311
Int. Cl.³ B01J 8/38; F27B 15/08, 15/10
U.S. Cl. 422—143 8 Claims



1. Apparatus for processing matter in a turbulant mass of particulate material, said apparatus comprising:

means defining an annular treatment zone with a gas inlet means into said treatment zone;

angled vane means for providing a swirling pattern of gas flow in said annular treatment zone which is expanded upwardly from said vane means towards center of said zone;

a particulate inlet means for introducing a mass of particulate material into said treatment zone in such a manner so as to entrain said particulate matter in said swirling flow;

said treatment zone having a shape to maintain said mass of particulate material substantially in a compact turbulent band within said treatment zone in response to said flow of gas and at least one opening for outlet of said gas and particulate material.

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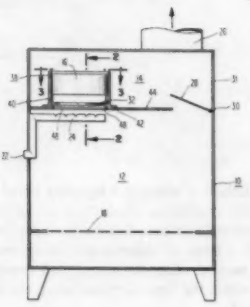
4,479,921

## SOLID FUEL HEATING APPLIANCE AND COMBUSTOR APPARATUS THEREFOR

Roger A. Allaire, Big Flats; Louis S. Socha, Jr., Painted Post, and Robert V. Van Dewoestine, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,844
Int. Cl.³ F01N 3/10
U.S. Cl. 422—180 15 Claims



1. In a solid fuel heating appliance of the type comprising:

a combustion chamber;

a flue for removing exhaust from said chamber;

a combustor located in an exhaust path between said chamber and said flue at a position where, in the absence of a flame breaking means, the flame of burning solid fuel in said chamber directly impinges on said combustor, said combustor having a plurality of cells extending therethrough for oxidizing oxidizible species in said exhaust, the improvement comprising:

a flame breaking means located between said chamber and said combustor, said flame breaking means including a solid portion interrupted by a multiplicity of openings to allow exhaust to pass therethrough to light off and maintain oxidation of the oxidizable species in the combustor while minimizing the impringement on said combustor by flames within said chamber and to produce a pressure drop across the flame breaking means substantially less than the pressure drop across the combustor.

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4,479,922

## SOLVENT TREATMENT IN THE SEPARATION OF PALLADIUM AND/OR GOLD FROM OTHER PLATINUM GROUP AND BASE METALS

Richard Haynes, East Windsor; Anna M. Jackson, Somerset County, and Martin K. Zierold, Lakewood, all of, assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,077
Int. Cl.³ C01G 55/00, 7/00
U.S. Cl. 423—22 17 Claims

1. A solvent extraction method for separating palladium and gold metal ions from other metal ions and/or from each other including the steps mixing an aqueous acidic chloride solution containing the metal ions to be extracted with a water immisci-

ble organic phase which includes an organic extractant comprising a thioether having the formula R'—S—R wherein R' and R are organic radicals of the same or different types having a carbon atom bonded to the sulphur (S) atom and separating the aqueous phase from the organic phase, including the step of treating said water immiscible organic phase prior to mixing said phase with the aqueous phase, with an oxidizing agent capable of essentially eliminating any impurity of the type R—S—H from the organic phase wherein R is an organic radical, S is sulphur and H is hydrogen, said oxidizing agent being incapable of oxidizing the thioether.

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**4,479,923**

## PRODUCTION OF PHOSPHORIC ACID AND ADDITIONAL PRODUCTS FROM PHOSPHATE ORE

**John B. Sardisco; Dysart E. Holcomb, both of Shreveport, La., and Erhart K. Drechsel, deceased, late of Montgomery, Tex. (by Harriet K. Drechsel, executrix), assignors to Pennzoil Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 338,999, Jan. 12, 1982, Pat. No. 4,393,032. This application Jul. 6, 1983, Ser. No. 511,386**

**The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.**

**Int. Cl.³ C01B *25/16, 15/16, 25/26***

**U.S. Cl. 423—320** **31 Claims**

1. A process for the production of phosphoric acid from deslimed phosphate ore which comprises the steps of:

(a) contacting said deslimed phosphate ore with a sufficient amount of a phosphoric acid solution in an aciduluator to solubilize said phosphate ore and convert at least a portion of the calcium contained in the ore so as to form a solution of monocalcium phosphate in phosphoric acid containing sand solids and residual slimes, said solubilization being carried out by a process wherein the deslimed phosphate ore is solubilized by contact in a countercurrent manner with recycle phosphoric acid solution containing about 25 to 45 weight percent $P_2O_5$ with the solubilization being conducted at a temperature of about 40°-90° C., a residence time of about ¼ to 8 hours, and a recycle ratio of $P_2O_5$ in the recycle acid to $P_2O_5$ in the rock of about 7:1 to 18:1, said recycle phosphoric acid being a portion of the phosphoric acid product or a portion of the slurry from a second crystallizer of step (d) which contains phosphoric acid and calcium sulfate;

(b) passing said solution through a separator to remove the sand solids from the solution of monocalcium phosphate in phosphoric acid and dividing the solution into two portions, said solution still containing residual slimes;

(c) contacting one of said portions which still contains residual slimes, with sufficient sulfuric acid in a first crystallizer to convert all the incoming calcium equivalent to the calcium in the ore to calcium sulfate, and wherein the sulfuric acid is added to the said portion at a sufficient rate to maintain a total $SO_3$ content in the first crystallizer solution of about 1.5 to 4.0 weight percent and form a mixture containing phosphoric acid and calcium sulfate, the solids content in the crystallizer being about 10–35% with a residence time of about 1 to 3 hours;

(d) reacting the mixture from the first crystallizer with the remaining portion of the said solution which still contains residual slimes, in a second crystallizer, there being sufficient calcium in the said remaining portion to neutralize the $SO_3$ content contained in the mixture from the first crystallizer and form a slurry containing calcium sulfate and phosphoric acid, the solids content in the crystallizer being about 10–35% with a residence time of about 1 to 3 hours;

(e) removing the resulting slurry;

(f) passing to a separator and separating the calcium sulfate solids from the phosphoric acid solution, the amount of $P_2O_5$ and calcium entering the separator being substantially the same as the amount of $P_2O_5$ and calcium entering the process in the phosphate ore; and

(g) recovering the phosphoric acid.

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**4,479,924**

## PROCESS FOR THE SEPARATION OF HEAVY METAL COMPOUNDS FROM PHOSPHORIC ACID

**Helmold von Plessen, Königstein; Reinhard Gradl, Hürth, and Günther Schimmel, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Apr. 1, 1983, Ser. No. 481,281**

**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1982, 3212675**

**Int. Cl.³ C01B *25/16***

**U.S. Cl. 423—321 R** **5 Claims**

1. A method for removing heavy metal compounds of cadmium, mercury, or lead from crude phosphoric acid obtained according to the Odda process, which method comprises adjusting the pH of said crude phosphoric acid with ammonia to a value from 0.5 to 1.5 and then contacting the acid at a temperature from 10° C. to 100° C. with a diorganyldithiophosphorus compound selected from the group consisting of dithiophosphoric acid diesters, dithiophosphonic acid monoesters, and dithiophosphinic acids in an amount which is 2 to 5 times the molar amount of heavy metal ions to be removed and with an amount of an adsorbent which is from 0.05 to 5 percent by weight of the crude phosphoric acid wherein said adsorbent is active charcoal, carbon black, ground lignite, porous resins, kieselgulr, bleaching earth, silica gel, synthetic silicic acids, or zeolites.

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**4,479,925**

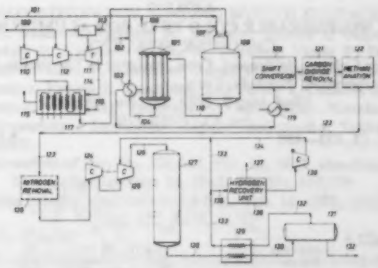
## PREPARATION OF AMMONIA SYNTHESIS GAS

**Philip J. Shires, Katy; John R. Cassata, Houston; Bernard G. Mandelik, Houston, and Christiaan P. van Dijk, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.**

**Filed Sep. 13, 1982, Ser. No. 417,718**

**Int. Cl.³ C01C *1/04***

**U.S. Cl. 423—359** **8 Claims**




1. A process for producing ammonia synthesis gas which comprises:

(a) introducing normally gaseous hydrocarbon fresh feed and steam to an endothermic, catalytic conversion zone operated under steam reforming conditions to produce primary reformed gas containing hydrogen, carbon oxides, methane, and steam;

(b) compressing air by centrifugal means driven by a fuel gas turbine and heating the compressed air to a temperature in the range of from 700° C. to 900° C. by indirect heat exchange with exhaust gas from the gas turbine;

(c) introducing the primary reformed gas and the heated compressed air from step (b) to an adiabatic, catalytic conversion zone operated under autothermal reforming conditions to produce raw, hot, ammonia synthesis gas;

(d) passing said raw, hot, ammonia synthesis gas to the endothermic catalytic conversion zone in indirect heat ex-

change with the normally gaseous hydrocarbon and steam therein to provide the entire heat of conversion in the endothermic catalytic conversion zone; and

(e) recovering raw ammonia synthesis gas from the endothermic catalytic conversion zone.

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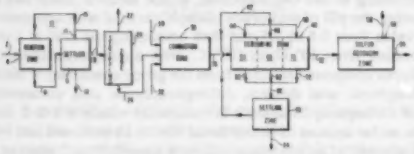
**4,479,926**

## TREATMENT OF RESIDUAL BOTTOMS FROM FLUOROSULFURIC ACID REGENERATION

**William C. Behrmann, and Thomas G. Jones, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Dec. 19, 1983, Ser. No. 563,076**
**Int. Cl.³ C01B *17/46, 7/19, 17/50, 17/04***
**U.S. Cl. 423—467** **22 Claims**



1. In a process for recovering fluorosulfuric acid from a solution comprising fluorosulfuric acid and acid soluble oils wherein the solution is passed to a recovery zone and separated therein into a fluorine-rich fraction and into a residuum comprising acid soluble oil and a minor amount of fluorosulfuric-containing compounds, the improvement comprising:

(a) passing residuum into a combustion zone wherein the residuum is combusted to form combustion products;

(b) passing combustion products from the combustion zone through a scrubbing zone adapted to remove fluorine from the combustion products; and,

(c) passing combustion products through a sulfur recovery zone adapted to remove sulfur from the combustion products.

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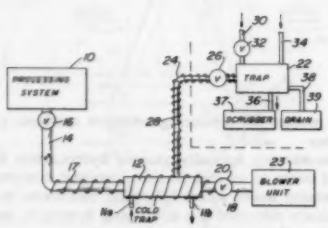
**4,479,927**

## REGENERABLE COLD TRAP FOR ALUMINUM CHLORIDE EFFLUENT

**Barry Gelernt, Bridgeport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Aug. 9, 1982, Ser. No. 406,625**
**Int. Cl.³ C01B *7/01***
**U.S. Cl. 423—481** **5 Claims**




1. In a chemical processing system which produces aluminum chloride gas as a by-product,

a process for rendering said aluminum chloride gas harmless comprising the steps of:

selectively transferring said aluminum chloride gas to a cold trap,

cooling said cold trap to cause said aluminum chloride gas to solidify while said system is in operation,

heating said cold trap to cause said aluminum chloride solid to vaporize while the operation of said processing system is discontinued,

transferring said aluminum chloride vapor to a second trap,

cooling said second trap to cause said aluminum chloride vapor to solidify,

injecting water into said second trap for reaction with said aluminum chloride to form hydrogen chloride,

draining said hydrogen chloride from said second trap.

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**4,479,928**

## CATALYTIC PROCESS FOR THE PRODUCTION OF SULPHUR FROM A GAS CONTAINING $H_2S$

**Robert Voirin, Orthez, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France**

**Filed Aug. 19, 1982, Ser. No. 409,604**
**Claims priority, application France, Aug. 19, 1981, 81 15900**
**Int. Cl.³ C01B *17/02***
**U.S. Cl. 423—574 R** **28 Claims**

1. A catalytic process for the production of sulphur from an acid gas containing $H_2S$, which comprises: contacting said acid gas at a temperature from about 200° to 900° C. in the presence of an oxidation catalyst, with a controlled quantity of a gas containing free oxygen to form a gaseous effluent containing $H_2S$ and $SO_2$ in a $H_2S/SO_2$ molar ratio substantially equal to 2/1 and a proportion of sulphur; and cooling and contacting said effluent with a CLAUS catalyst to form a further quantity of sulphur, wherein the $H_2S$ oxidation catalyst consists essentially of a refractory porous matrix having a surface area of at least 5 $m^2/g$ comprising 50 to 100% by weight of at least one composition selected from the group consisting of silica, titanium oxide, expressed as $TiO_2$, zirconium oxide, expressed as $ZrO_2$ and zeolites and 0 to 50% by weight of alumina and containing about 0.5 to 15% by weight of the calcined catalyst, expressed as percent by weight of of metal, of at least one metal compound selected from the group consisting of Fe, Cu, Zn, Cd, Cr, Mo, W, Co, Ni, and Bi.

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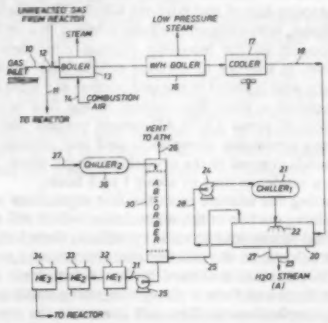
**4,479,929**

## PRODUCTION OF SULFUR FROM A $H_2S$-BEARING GAS STREAM

**F. Hilton Lacy, Jr., Houston, Tex., assignor to Mineral & Chemical Resource Co., Houston, Tex.**

**Continuation-in-part of Ser. No. 385,779, Jun. 7, 1982, abandoned. This application Dec. 9, 1982, Ser. No. 448,200**
**Int. Cl.³ C01B *17/05***
**U.S. Cl. 423—575** **9 Claims**




1. A process for treating gases containing $H_2S$ comprising the steps of:

combusting the $H_2S$ of approximately one-third of an inlet stream containing $H_2S$ to $SO_2$;

contacting the $SO_2$ from said combusting step with an absorbent consisting essentially of a phosphonate absorbent, whereby said $SO_2$ is selectively absorbed;

reacting the $H_2S$ from the remainder of said inlet stream with said absorbed $SO_2$ in the presence of said phosphonate absorbent, thereby forming elemental sulfur and water; and,

separating the sulfur and water thus formed from said phosphonate absorbent.

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**4,479,930**

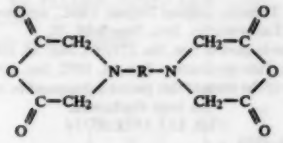
## AMINES COUPLED WTH DICYCLIC DIANHYDRIDES CAPABLE OF BEING RADIOLABELED PRODUCT

**Donald J. Hnatowich, Worcester, Mass., assignor to Trustees of the University of Massachusetts, Amherst, Mass.**

**Filed Jul. 26, 1982, Ser. No. 401,834**
**Int. Cl.³ A61K *43/00, 49/00***
**U.S. Cl. 424—1.1** **18 Claims**

7. A process for making a radionuclide labeled composition comprising the steps of:

preparing a solid chelating agent having the formula



wherein R is a linking moiety containing between 1 and 25 carbon atoms;

mixing said solid chelating agent with a primary or secondary amine containing at least one amine group able to form an amide bond with said chelating agent; and

adding a radioactive metallic cation to said conjugate to form a transcomplexed molecule.

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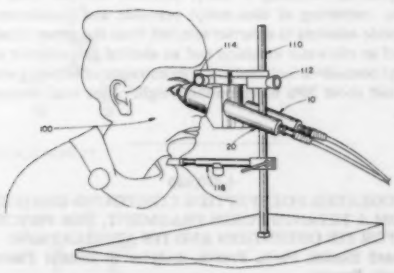
**4,479,931**

## METHOD FOR NON-INVASIVE DETECTION OF OCULAR MELANOMA

**Richard M. Lambrecht, Quogue, and Samuel Packer, Floral Park, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Sep. 23, 1982, Ser. No. 422,511**
**Int. Cl.³ A61K *49/00***
**U.S. Cl. 424—1.1** **9 Claims**



1. A method for non-invasively and accurately diagnosing ocular cancer comprising:

(a) providing two radiation detectors;

(b) positioning each of said detectors respectively before each of the eyes of a subject so that each detector will measure the radiation level in its associated eye under substantially identical conditions;

(c) simultaneously measuring and recording the integrated output of each of said detectors, thereby to normalize said measured radiation levels to a preselected standard, whereby a predetermined positive differential recorded for the normalized radiation level of one detector gives an indication of ocular cancer in the eye associated with that detector.

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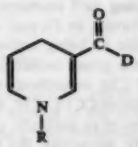
**4,479,932**

## BRAIN-SPECIFIC DRUG DELIVERY

**Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.**

**Filed May 18, 1982, Ser. No. 379,316**
**Int. Cl.³ A61K *49/00; C07J 1/00***
**U.S. Cl. 424—9** **25 Claims**

8. A compound adapted for the site-specific/sustained delivery of a centrally acting drug species to the brain, said compound having the formula



wherein R is lower alkyl or benzyl and D is the residue of the drug phenethylamine, amphetamine, dextroamphetamine, levamphetamine or phentermine, said residue being characterized by the absence of a hydrogen atom from the $—NH_2$ functional group in said drug.

23. A method for site-specifically/sustainedly delivering phenethylamine, amphetamine, dextroamphetamine, levamphetamine or phentermine to the brain, said method comprising administering to an animal in need of such treatment a quantity of a compound as claimed in claim 8 sufficient to release a pharmacologically effective amount of phenethylamine, amphetamine, dextroamphetamine, levamphetamine or phentermine, respectively, to the brain.

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**4,479,933**

## COMPOSITION FOR SEALING WOUND SURFACES

**Alla Y. Akimova; Valentin M. Buyanov; Eduard I. Galperin; Anatoly B. Davydov; Galina M. Derkach; Vitaly P. Derevyanko; Viktor V. Keshelava; Larisa P. Malyarova; Igor G. Rusakov; Valeria I. Timokhina, and Valery I. Chissov, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki, U.S.S.R.**

**Continuation of Ser. No. 234,542, Feb. 13, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 419,039**
**Claims priority, application U.S.S.R., Feb. 14, 1980, 2912942**
**Int. Cl.³ A61K *31/78***
**U.S. Cl. 424—81** **4 Claims**

1. A composition for sealing wound surfaces consisting of an ester of α-cyanacrylic acid or a mixture of esters of α-cyanacrylic acid, at least one monoalkyl ester of a polyethylene glycol formed by the reaction of ethylene oxide with a primary aliphatic alcohol and having the formula:

$$C_nH_{2n+1}O(C_2H_4O)_mH,$$

wherein n = 10 to 18, m = 7 to 10, and a water-soluble ketone, the components being present in the following proportions, in percent by weight:

| | |
|---|---|
| ester of α-cyanacrylic acid or mixture of esters of α-cyanacrylic acid | 95–75 |
| monoalkyl ester of polyethylene glycol | 0.01–0.5 |
| water soluble ketone | 4.5–24.99. |

4,479,934

## METHOD AND AGENT FOR THE THERAPY OF IMMUNOCOMPLEX DISEASES

Hans-Harald Sedlacek, and Friedrich R. Seiler, both of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,645

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853453

Int. Cl.³ A61K *39/00, 37/04, 39/395*

U.S. Cl. 424—85 1 Claim

1. A method for treating an immunocomplex disease in a patient suffering from such a disease, which method comprises locally or parenterally administering to said patient an effective amount of at least one Fc-reagent which reacts directly or indirectly with the Fc-part of the antibody contained in the immunocomplex causing said immunocomplex disease, said Fc-reagent itself not having an Fc-part which is immunologically active or capable of being activated, said Fc-reagent being selected from the group consisting of the complement factors C1q, C3b, and C3d; an antibody which reacts with any of said complement factors C1q, C3b, and C3d; $F(ab)_2$-fragments or Fab-fragments of an antibody, obtained by enzymatic fission of the antibody; antibodies, the Fc-part of which has been inactivated by chemical modification; antibodies which are rheumatoid factors; and antibodies produced by the immunization of an animal with immunoglobulin or with a fragment of immunoglobulin having an immunologically-modified activated Fc-part.

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4,479,935

## FRACTIONS EXTRACTED FROM AEROBIC BACTERIA, ENDOWED WITH ANTITUMORAL, ANTIBACTERIAL AND INTERFERON INDUCING PROPERTIES, AND PROCESS FOR THEIR PREPARATION

Tiberius Metianu, Charenton, and Bernard Bizzini, Paris, both of France, assignors to Institut Pasteur, Paris, France

Filed Apr. 15, 1981, Ser. No. 254,254

Claims priority, application France, Apr. 22, 1980, 80 08976; Mar. 30, 1981, 81 06294

Int. Cl.³ A61K *39/05;* C12N *1/20*

U.S. Cl. 424—92 9 Claims

1. Substantially pure washed whole cells of the species *Corynebacterium calarrhalis* I-116, said cells being substantially non-toxic and having an immunostimulating effect upon administrations to test animals.

5. An immunostimulating composition comprising an immunostimulating amount of the whole cells in accordance with claim 1 and a pharmaceutically acceptable excipient.

9. A method for increasing the resistance to infection of animals having an immunitary deficiency, comprising administering an immunostimulating amount of the whole cells in accordance with claim 1.

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4,479,936

## METHOD FOR PROTECTING THE GROWTH OF PLANTS EMPLOYING MUTANT SIDEROPHORE PRODUCING STRAINS OF *PSEUDOMONAS PUTIDA*

Peter A. Vandenbergh, and Carlos F. Gonzalez, both of Sarasota, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Sep. 27, 1982, Ser. No. 423,814

Int. Cl.³ A01N *63/00;* A61K *37/00;* C12N *1/20, 15/00;* C12R *1/38, 1/40;* A01B *79/00;* A01C *1/00*

U.S. Cl. 424—93 12 Claims

1. A method for protecting the growth of a higher plant against phytopathogenic fungi which inhibit the growth of the plant, and are found in the soil, which comprises contacting a fungicidally effective amount of *Pseudumonas putida* which has the identifying characteristics of *Pseudomonas putida* NRRL-B-12537 on the plant or in the soil around the plant.

4,479,937

## PROCESS OF TREATING INFLAMMATION WITH HUMAN URINARY THIOL PROTEASE INHIBITOR

Hiroshi Sato, Toda; Koji Sasaki, Omiya; Kaname Takagi, Tama; Hajime Hiratani, Osaka, and Yoshikazu Yuki, Kobe, all of Japan, assignors to Zeria Shinyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,549

Claims priority, application Japan, Feb. 24, 1983, 58-29737

Int. Cl.³ A61K *35/22*

U.S. Cl. 424—99 8 Claims

1. A process of treating inflammation comprising the administration of an effective amount of human urinary thiol protease inhibitor to reduce said inflammation.

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4,479,938

## THERAPEUTIC COMPOSITION CONTAINING FACTOR VIIA

William R. Thomas, Laguna Niguel, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 277,469, Jun. 25, 1981, Pat. No. 4,382,083. This application Jun. 14, 1982, Ser. No. 388,325

The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 7 Claims

1. A composition for treating patients having deficiencies or inhibitors of blood clotting factors which comprises a sterile composition in which the sole effective, activated hemostatic agent is an effective amount of factor VIIa.

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4,479,939

## METHOD AND COMPOSITION FOR THE TREATMENT OF ACNE

Theodor Eckert; Siegfried Nolting, and Fritz Kemper, all of Münster, Fed. Rep. of Germany, assignors to Dr. August Wolff, Chemisch-Pharmazeutische Fabrik GmbH & Co. KG., Bielefeld, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,420

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147504

Int. Cl.³ A61K *31/00, 31/075, 47/00*

U.S. Cl. 424—172 8 Claims

1. A composition for the topical treatment of acne, said composition including a diacyl peroxide selected from the group consisting of didecanoyl peroxide and didodecanoyl peroxide admixed in a carrier selected from the group consisting of an oil/water emulsion and an alcohol gel, wherein said diacyl peroxide is included in a concentration of between about 3% and about 20% based on the weight of the total composition.

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4,479,940

## THIOLATED POLYPEPTIDE COMPOUND DERIVED FROM A TETANUS TOXIN FRAGMENT, THE PROCESS FOR ITS OBTENTION AND ITS APPLICATIONS

Bernard Bizzini, Paris, France, assignor to Institut Pasteur, Paris, France

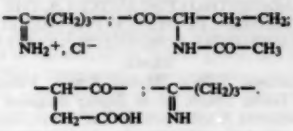
Filed Jan. 21, 1982, Ser. No. 341,335

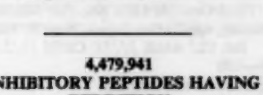
Claims priority, application France, Jan. 22, 1981, 81 01176

Int. Cl.³ C07C *103/52;* A61K *37/02*

U.S. Cl. 424—177 6 Claims

1. A thiolated polypeptide compound constituted by the $H_c$ fragment of tetanus toxin to which at least one —SH group is directly or indirectly bound through the amino groups thereof, said compound being obtained by thiolation and comprising at least one Z-SH group, wherein Z is the residue of a thiolation agent and is chosen from the group consisting of:





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**4,479,941**

## RENIN INHIBITORY PEPTIDES HAVING PHE[13] DELECTION

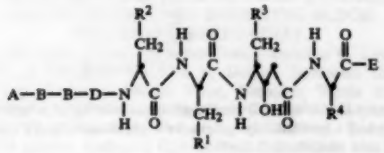
**Daniel F. Veber, Ambler; Joshua S. Boger, Bryn Mawr, and Mark G. Bock, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 329,166, Dec. 10, 1981, abandoned. This application Nov. 4, 1982, Ser. No. 438,841**

**Int. Cl.**[3] *C07C 103/52;* **A61K** *37/02*

**U.S. Cl. 424—177** **8 Claims**

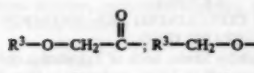
1. A peptide of the formula:



(I.)

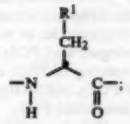
wherein:

A is hydrogen;

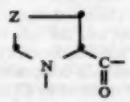


where n is 0 to 5 and $R^3$ has the same meaning as set out further below, and may additionally be hydrogen;

B is absent; glycyl; sarcosyl; or



D is absent; or



where Z is $(CH_2)_n$ and n is 1 or 2; or —S—;

$R^1$ is hydrogen; $C_{1-4}$ alkyl; hydroxy $C_{1-4}$ alkyl; phenyl; phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo; indolyl; 4-imidazolyl; amine $C_{2-4}$ alkyl; guanidyl $C_{2-3}$ alkyl; or methylthiomethyl;

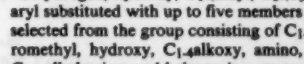
$R^2$ is hydrogen $C_{1-4}$; alkyl; phenyl; phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo; or indolyl;

$R^3$ is $C_{3-6}$ alkyl; $C_{3-7}$ cycloalkyl; phenyl; or $C_{3-7}$cycloalkyl or phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo;

$R^4$ is hydrogen; or

where $R^5$ is hydrogen; $C_{1-4}$ alkyl; hydroxy; or $C_{3-7}$ cycloalkyl; and

E is



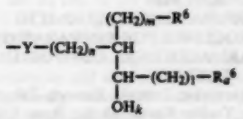
(1)

where

Y is —NH— or —O—;

n is 0 to 5; and

$R^6$ is hydrogen; hydroxy; $C_{1-4}$alkyl; $C_{3-7}$cycloalkyl; aryl; aryl substituted with up to five members independently selected from the group consisting of $C_{1-6}$alkyl, trifluoromethyl, hydroxy, $C_{1-4}$alkoxy, amino, mono- or di-$C_{1-4}$ alkylamino, and halo; amino; mono-, di-, or tri-$C_{1-4}$alkylamino; guanidyl; heterocyclic; or heterocyclic substituted with up to five members independently selected from the group consisting of $C_{1-4}$alkyl, hydroxy, trifluoromethyl, $C_{1-4}$alkoxy, halo, aryl, aryl $C_{1-4}$alkyl, amino, and mono- or di-$C_{1-4}$alkylamino;



(2)

where

Y is as defined above;

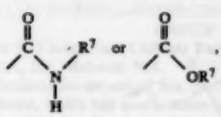
n is 0 or 1;

k is 0 or 1;

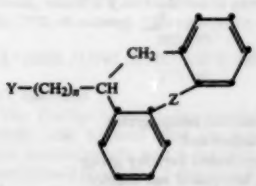
1 is 1 to 4;

m is 1 to 4; and

$R^6$ and $R_a^6$ may be the same or different and have the same meaning as $R^6$ above and $R_a^6$ may additionally be



where $R^7$ is hydrogen or $C_{1-3}$alkyl; or



(3)

where

Y is as defined above;

n is 0 or 1; and

Z is

(a) $-(CH_2)_n-CH-$ (with $R^7$)

where

n is 0 or 1; and

$R^7$ is as defined above; or

(b) $-(CH_2)_n-C-$ (with $=CH_2$)

where

n is 0 or 1;

wherein all of the asymmetric carbon atoms have an S configuration, except for those in the B, D, and E substituents, which may have an S or R configuration; and a pharmaceutically acceptable salt thereof.

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**4,479,942**

## TETRAHYDROFURANCARBOXYLIC ACID DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREOF

**Michio Yamashita, Takarazuka; Tadaaki Komori, Takatsuki; Junji Hosoda, Kobe; Yoshio Kawai, Ikeda; Itsuo Uchida, Kyoto; Masanobu Kohsaka, Sakai; Hiroshi Imanaka, Osaka; Kazuo Sakane, Amagasaki; Hiroyuki Setoi, Toyonaka, and Tsutomu Teraji, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

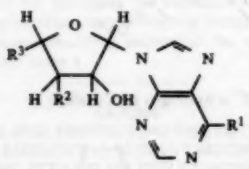
**Filed Jul. 29, 1982, Ser. No. 403,117**

**Claims priority, application United Kingdom, Aug. 10, 1981, 8124352**

**Int. Cl.³ A61K** *31/70;* **C07H** *17/00, 19/06*

**U.S. Cl. 424—180** **11 Claims**

1. A compound of the formula:



wherein

$R^1$ is amino or a protected amino group,

$R^2$ is amino or acylamino and

$R^3$ is carboxy or a protected carboxy group

or a pharmaceutically acceptable salt thereof.

11. An antimicrobial pharmaceutical composition comprising an antimicrobially effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

**4,479,943**

## 3-DEMETHOXYISTAMYCIN B, THE 2'-N-FORMIMIDOYL DERIVATIVE THEREOF AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

**Hamao Umezawa, Tokyo; Shinichi Kondo, Yokohama, and Daishiro Ikeda, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan**

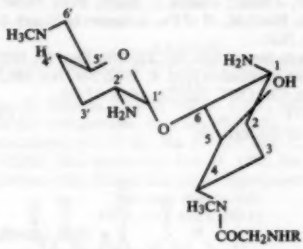
**Filed Oct. 26, 1983, Ser. No. 545,686**

**Claims priority, application Japan, Nov. 5, 1982, 57-193436**

**Int. Cl.³ A61K** *31/71;* **C07H** *15/22*

**U.S. Cl. 424—180** **12 Claims**

1. A compound of the formula



(I)

wherein R is selected from the group consisting of a hydrogen atom and a formimidoyl group, or a pharmaceutically acceptable acid addition salt thereof.

10. The compound, 1,2',6'-tri-N-tert-butoxycarbonyl-3-demethoxyistamycin $B_0$ 4,5-carbamate.

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**4,479,944**

## COMPOSITION CONTAINING $PGI_2$ ANALOGS STABILIZED

**Masaki Hayashi; Katsuhiko Shuto, both of Takatsuki, and Yoshitsugu Iijima, Hikone, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan**

**Filed May 2, 1978, Ser. No. 902,118**

**Claims priority, application Japan, May 6, 1977, 52-51278**

**Int. Cl.³ C07D** *307/395;* **A61K** *31/72*

**U.S. Cl. 424—180** **20 Claims**

1. A stabilized composition which contains a $PGI_2$ analogue in solution in a solvent consisting essentially of at least one pharmacologically-acceptable alcohol, N,N-dimethylacetamide, N,N-dimethylformamide, hexamethylphosphoramide, dimethyl sulphoxide, or a middle chain triglyceride, or which is a cyclodextrin clathrate of a $PGI_2$ analogue, said $PGI_2$ analogue being selected from the group consisting of $PGI_2$ compounds in which the carboxyl group of $PGI_2$, 5(E)$PGI_2$, 11-deoxy-$PGI_2$, 13,14-dihydro-$PGI_2$, trans-delta2-$PGI_2$, 16-chloro-$PGI_2$, 7-methyl-$PGI_2$ and 7a-homo-$PGI_2$ is esterified or replaced by $CH_2OH$, compounds differing from $PGI_2$ 5(E)-$PGI_2$, 11-deoxy-$PGI_2$, 13,14-dihydro-$PGI_2$, and trans-delta2-$PGI_2$ by having a longer or shorter side chain attached to the 6- or 12-position, and in which the side chain attached to the 6-position may carry an alkyl substituent and the side chain attached to the 12-position may carry an alkyl, hydroxy, cycloalkyl, phenyl or phenoxy substituent, and such compounds in which the carboxyl group is esterified or replaced by $CH_2OH$.

4. A pharmaceutical composition useful for the treatment of arteriosclerosis, cardiac failure or thrombosis which comprises, as active ingredient, an effective amount of a cyclodextrin clathrate of a $PGI_2$ analogue in association with a pharmaceutically acceptable carrier, said $PGI_2$ analogue being selected from the group consisting of compounds in which the carboxy group of $PGI_2$ is esterified or replaced by an alcohol group (—$CH_2OH$), compounds which possess carbon skeletons similar to that of $PGI_2$ with a corresponding carboxy group but in which the side chains attached to the 6- and 12-positions may be longer or shorter than those of $PGI_2$, and

in which the side chain attached to the 6-position may carry an alkyl substituent and the side chain attached to the 12-position may carry an alkyl, hydroxy, cycloalkyl, phenyl or phenoxy substituent, and such compounds in which the carboxy group is esterified or replaced by an alcohol group, and corresponding 5(E)-$PGI_2$ compounds, corresponding 11-deoxy-$PGI_2$ compounds, corresponding 13,14-dihydro-$PGI_2$ compounds, corresponding trans-$\Delta^2$-$PGI_2$ compounds, corresponding 16-chloro-$PGI_2$ compounds, corresponding 7-methyl-$PGI_2$ compounds, and corresponding 7a-homo-$PGI_2$ compounds.

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**4,479,945**

## INTER-M-PHENYLENE-PROSTACYCLIN ANALOGUES AND USE THEREOF IN INHIBITING BLOOD PLATELET AGGREGATION

**István Székely, Dunakeszi; Sádor Botá; Marianna G. Lovász, both of Budapest; Krisztina K. Dolgos, Debrecen; Gábor Kovács, Budapest; Sándor Virág, Budapest; Tamás Szüts, Budapest; Istvá Rákóczi, Budapest; Károly Tihanyi, Budapest; Péter Körmöczy, Budapest; Pál Hadházy, Budapest; Istvá Stadler, Budapest; György Blaskó, Budapest, and Béla Köszegi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary**

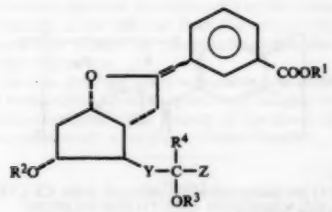
**Filed Nov. 29, 1982, Ser. No. 445,044**

**Claims priority, application Hungary, Dec. 1, 1981, 3600/81; Oct. 22, 1982, 3378/82**

**Int. Cl.³ A61K** *31/34;* **C07D** *307/935*

**U.S. Cl. 424—184** **16 Claims**

1. A compound of the formula I



wherein

$R^1$ is hydrogen, $C_1$ to $C_4$ alkyl, or a pharmaceutically acceptable primary, secondary, tertiary, or quaternary ammonium cation, or a pharmaceutically acceptable metal cation,

$R^2$ and $R^3$ are each independently hydrogen, $C_1$ to $C_6$ alkanoyl, benzoyl, p-phenyl-benzoyl, tetrahydropyranyl, 1-ethoxy-ethoxy, 1,4 dioxanyl, or an alkylsilyl-protecting group,

$R^4$ is hydrogen or $C_1$ to $C_4$ alkyl,

Y is —C≡C— or a trans —CH=CW— group, wherein W is chloro, bromo or fluoro, and

Z is n-hexyl or n-heptyl or Z is phenylmethyl, naphthylmethyl, phenoxymethyl, or naphthyloxymethyl, each of which is unsubstituted or substituted by $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy, halogen, trifluoromethyl, nitro, phenyl, or naphthyl.

16. A method of inhibiting blood platelet aggregation which comprises the step of administering to a subject in need thereof a pharmaceutically effective amount of the compound of the Formula (I) defined in claim 1.

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**4,479,946**

## PHOSPHORUS ESTERS OF AMIDOXIMES, AND COMPOSITIONS FOR AND METHODS OF CONTROLLING INSECTS USING THEM

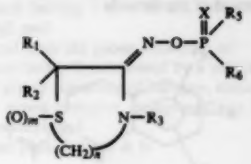
**Leonard E. Hodakowski, St. Albans, and Dean F. Busbey, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.**

**Continuation of Ser. No. 163,495, Jun. 27, 1980, abandoned. This application Jun. 17, 1982, Ser. No. 378,852**

**Int. Cl.³ A01N** *57/32;* **C07F** *9/65*

**U.S. Cl. 424—200** **27 Claims**

1. Compounds of the formula:



Z

wherein

m is 0, 1 or 2;

n is 0 or 1;

X is O or S;

$R_1$ and $R_2$ can be the same or different and are hydrogen or $C_1$ to $C_6$ alkyl; with the proviso that when n is 0, Z is C=N—$R_4$, and when n is 1, Z is $CH_2$ and $R_3$ is hydrogen or lower alkyl;

$R_3$ and $R_4$ can be the same or different and is lower alkyl ($C_1$–$C_6$) or together forms a cyclic alkylene or alkenylene group thereby forming a five or six membered ring which can also have nitrogen, or carbonyl, in addition to the two nitrogens said alkylene or alkenylene ring systems being optionally substituted with one or two $C_1$ to $C_4$ alkyl, cyclohexyl, halogen, nitrile, or nitro groups;

$R_5$ and $R_6$ is the same or different and is $C_1$ to $C_5$ alkyl, $C_1$ to $C_5$ alkoxy, $C_1$ to $C_5$ alkylthio, alkylthioalkyl, dialkylamino, or alkylamino.

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**4,479,947**

## ORAL ABSORPTION ENHANCEMENT OF CARBOXYLIC ACID PHARMACEUTICALS USING (5-ALKYL-2-OXO-1,3-DIOXOLEN-4-YL)METHYL ESTER GROUP

**Burton G. Christensen, Cliffside Park, N.J., assignor to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 366,036, Apr. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 344,413, Feb. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 324,728, Nov. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 285,170, Jul. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 282,821, Jul. 13, 1981, abandoned. This application Jun. 7, 1982, Ser. No. 385,199**

**Int. Cl.³ A61K** *31/545, 31/665;* **C07D** *499/00, 501/46, 317/24, 277/40*

**U.S. Cl. 424—203** **11 Claims**

1. The (5-alkyl-2-oxo-1,3-dioxolen-4-yl)methyl ester of a carboxylic acid wherein alkyl has 1–6 carbon atoms and wherein said carboxylic acid is cefoxitin, methyldopa, 3β-[2-methoxyimino-2-(2-amino-1,3-thiazolol-4-yl)acetamido]-monobactamic acid, 2-ethylthio)-6β-(1R-hydroxyethyl)-penem-3-carboxylic acid or fosfomycin.

9. A pharmaceutical composition containing an effective amount of the compound of any one of claims 1 through 8 in a pharmaceutically acceptable carrier.

## 4,479,948

## TRIAZINO(2,1-A)ISOQUINOLINE DERIVATIVES, COMPOSITIONS AND THEIR USE AS MEDICAMENTS

Bansi Lal, Mulund; Adolf D'Sa, Vikhroli; Alihussein N. Dohadwalla, Cumballa Hill; Noel J. de Souza, Santa Cruz, all of India, and Horst Dornauer, Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

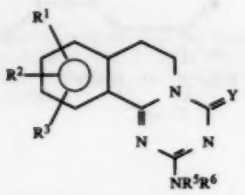
Filed Jul. 8, 1982, Ser. No. 396,393

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126837

Int. Cl.³ A61K *31/53, 31/535*

U.S. Cl. 424—248.4 12 Claims

1. A compound of the formula



or an acid addition salt thereof, wherein

$R^1$, $R^2$, and $R^3$, taken alone, are the same or different and are hydrogen, lower alkoxy, acyloxy, or halogen, or wherein an adjacent pair of $R^1$, $R^2$, and $R^3$, taken together, are alkylenedioxy;

$R^5$, and $R^6$, taken alone, are the same or different and are hydrogen, lower alkoxy, amino, lower alkylamino, lower dialkylamino, acylamino, lower alkoxycarbonylamino, a nitrogen-containing heterocycle, lower alkyl, $C_3$–$C_6$-cycloalkl, lower dialkylaminoalkyl, aralkyl, phenyl, or phenyl mono- to tri-substituted by halogen, hydroxy, nitro, $C_1$–$C_3$-alkyoxy, or $C_1$–$C_3$-alkyl, or wherein $R^5$ and $R^6$, taken together with the nitrogen atom to which they are bonded, are a substituted or unsubstituted nitrogen heterocycle or such a heterocycle containing a further nitrogen or oxygen atom; and

Y is oxygen or sulfur.

11. A pharmaceutical composition for the treatment of hypertension, which composition comprises a hypotensively effective amount of a compound or salt as in claim 1 and a pharmaceutically acceptable carrier therefor.

## 4,479,949

## BENZOTHIAZOLINE COMPOUNDS

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00363, § 371 Date Apr. 14, 1983, § 102(e) Date Apr. 14, 1983, PCT Pub. No. WO83/00865, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 10, 1982, Ser. No. 503,160

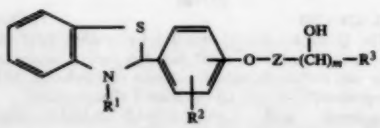
Claims priority, application Japan, Sep. 12, 1981, 56-144148

Int. Cl.³ A61K *27/00, 31/495;* C07D *417/00*

U.S. Cl. 424—248.4 14 Claims

1. A compound of the formula (I) and salts thereof,

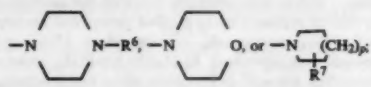
[I]



wherein

$R^1$ is lower alkanoyl;

$R^2$ is one or more group(s) selected from hydrogen, lower alkyl, lower alkoxy, hydroxy, halogen, nitro, halogeno-lower alkyl and sulfamoyl; $R^3$ is



$R^6$ is hydrogen, alkyl containing 1 to 8 carbon atoms, alkanoyl containing 2 to 8 carbon atoms, alkenoyl containing 2 to 8 carbon atoms or furylcarbonyl, each of which alkyl, alkanoyl and alkenoyl may be substituted by one or more groups selected from hydroxy, phenyl, and phenylcarbonyloxy, and said phenyl nucleus may be resubstituted by one or more groups selected from lower alkyl, hydroxy, halogen, lower alkoxy, nitro, cyano, acetamino and lower-alkylamino;

$R^7$ is hydrogen, hydroxy, phenyl-lower alkyl or benzoyl;

Z is straight or branched alkylene containing 1 to 6 carbon atoms;

m is 0 or 1;

n is 0 or 1;

p is 5,

wherein the terms lower alkyl, lower alkoxy and lower alkanoyl refer to groups having 1 to 6 carbon atoms.

12. A pharmaceutical composition comprising (i) a compound as in claim 1 in an amount sufficient for treatment for *angina cordis*, arrhythmia and thrombosis and (ii) at least one pharmaceutically acceptable excipient.

## 4,479,950

## AROYLAMINOACID DISULFIDES

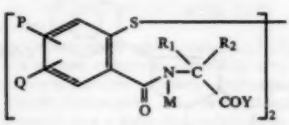
Paul R. Menard, Tuckahoe; Howard Jones, Ossining, both of N.Y., and John T. Suh, Greenwich, Conn., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,525

Int. Cl.³ A61K *31/195, 31/215;* C07C *149/40, 149/41;* C07D *401/12, 407/12, 409/12, 413/12*

U.S. Cl. 424—248.5 7 Claims

1. A compound of the structure



wherein:

P and Q are independently hydrogen, halo, $CF_3$, $OR_1$, $SR_1$, alkyl or $NR_1R_2$,

$R_1$ and $R_2$ are independently hydrogen, alkyl, aminoalkyl, aryl, aralkyl, heteroaryl, cycloalkyl, pyrrolidyl, piperidinyl, or morpholinyl;

Y is OH, $OR_1$, $NH_2$, or $N(R_1R_2)$; and

M is alkyl, cycloalkyl, aryl, aminoalkyl, aralkyl, pyrrolidyl, piperidinyl, morpholinyl, or heteroaryl,

wherein:

the alkyl groups and the alkyl moieties of aminoalkyl, alkoxy and thioalkyl contain from 1 to 6 carbon atoms; the cycloalkyl group contains from 3 to 8 carbon atoms; the aryl group contains from 6 to 10 carbon atoms; the aralkyl group contains from 7 to 16 carbon atoms; and the heteroaryl group is selected from pyridyl, quinolinyl, furyl, furfuryl and thienyl; and where Y is a hydroxy, their pharmaceutical acceptable, non-toxic alkali, alkaline earth and amine salts.

7. A method of treating hypertension in mammals by administering to said mammals an effective amount of a compound of claim 1.

## 4,479,951
## 1.4;3.6-DIANHYDROHEXITOL NITRATES SUBSTITUTED BY PURINE BASES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS

**Klaus Klessing, Ettlingen, and Shyam S. Chatterjee, Karlsruhe, both of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany**

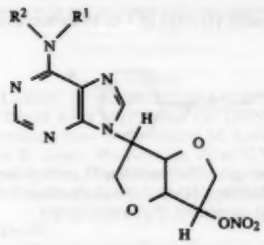
**Filed Jul. 20, 1981, Ser. No. 285,406**

**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028273**

**Int. Cl.³ A61K** *31/535;* **C07D** *473/34*

**U.S. Cl. 424—248.57** **22 Claims**

1. Adenyldesoxy-1.4;3.6-dianhydrohexitol nitrates having the formula Ia



(Ia)

wherein $R^1$ and $R^2$ are the same or different and, independently of one another signify

(a) a hydrogen atom,

(b) a straight-chained or branched alkyl group with 1 to 7 C-atoms,

(c) an ω-phenylalkyl group, whereby the alkyl group has 1 to 7 C-atoms and whereby the phenyl ring can be halogen-substituted in the p-position, or wherein

(d) $R^1$ signifies one of the residues given under (a) to (c) and $R^2$ an acyl radical of an aliphatic non-cyclic saturated monocarboxylic acid with 2 to 7 C-atoms, or wherein

(e) $R^1$ and $R^2$, together with the nitrogen atom to which they are bound, represent the residue of a cyclic, non-aromatic, secondary amine selected from the group consisting of pyrrolidine, piperidine, piperazine, morpholine, and 4-methyl-piperazine,

as well as their physiologically acceptable acid-addition salts.

21. A composition for treating coronary diseases comprising a pharmaceutically effective amount of the nitrate of claim 1 and pharmaceutically acceptable carriers therefor.

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## 4,479,952
## MONOSUBSTITUTED PIPERAZINES

**Gilbert Régnier, Chatenay Malabry, and Jacques Buré, Neuilly-sur-Seine, both of France, assignors to Science Union Et Cie, Suresnes, France**

**Filed Apr. 9, 1979, Ser. No. 28,049**

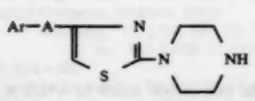
**Claims priority, application United Kingdom, Apr. 13, 1978, 14565/78**

**Int. Cl.³ A61K** *31/495;* **C07D** *417/04*

**U.S. Cl. 424—250** **6 Claims**

1. A pharmaceutical composition, useful in the treatment of inflammation, containing as active ingredient an effective anti-inflammatory amount of a compound selected from the group consisting of:

a monosubstituted piperazine of the formula:



in which:

A is selected from the group consisting of $-(CH_2)_n-$ in which n is selected from 1, 2 and 3, and

in which R is selected from the group consisting of alkyl having 1 to 5 carbon atoms inclusive, trifluoromethyl, unsubstituted phenyl, and phenyl mono- and polysubstituted by a substituent selected from the group consisting of halogen, alkyl and alkoxy each having 1 to 5 carbon atoms inclusive, and trifluoromethyl, and

Ar is selected from the group consisting of:

phenyl mono- and polysubstituted by a substituent selected from the group consisting of halogen, alkoxy having 1 to 5 carbon atoms inclusive, methylenedioxy, hydroxy, and trifluoromethyl, and

unsubstituted phenyl when A is

R in such case being selected from trifluoromethyl, phenyl, halophenyl, lower-alkylphenyl, lower-alkoxyphenyl, and trifluoromethylphenyl, and

physiologically-acceptable acid addition salts thereof, together with a pharmaceutically-acceptable carrier or diluent.

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## 4,479,953
## PYRAZINE ALDIMINE COMPOUNDS AS ANTIMICROBIAL AGENTS

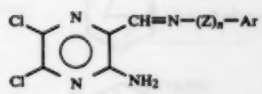
**Arthur J. Friedman, Marlboro, N.J., assignor to Merck & Co., Inc., Rahway, N.J.**

**Filed Aug. 25, 1983, Ser. No. 526,306**

**Int. Cl.³ C07D** *241/02;* **A01N** *43/60*

**U.S. Cl. 424—250** **9 Claims**

1. A pyrazine compound represented by the formula:



wherein

Z is —NH—, —$NHSO_2$—, —NHCO— or —S—,

Ar is phenyl or a phenyl ring substituted by 1 or 2 substituents selected from the group consisting of halo, lower alkyl, lower alkoxy or nitro, and

n is 0 or 1.

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## 4,479,954
## PIPERAZINE SUBSTITUTED CARBOXAMIDE DERIVATIVES, COMPOSITIONS AND METHOD OF USE

**Noriyasu Hirose; Shigeru Souda; Kazutoshi Miyake, all of Tokyo; Shizuo Kuriyama, Saitama; Kazuyasu Usuki, Tokyo; Yasuhiro Akiyama, Tokyo; Naoko Sakabe, Tokyo, and Hidetoshi Kawashima, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan**

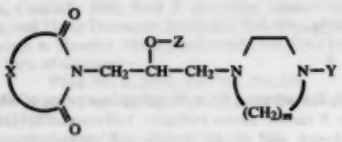
**Filed May 27, 1982, Ser. No. 382,792**

**Claims priority, application Japan, May 29, 1981, 56-80866**

**Int. Cl.³ A61K** *31/505;* **C07D** *521/00*

**U.S. Cl. 424—251** **43 Claims**

1. A carboximide derivative of the formula



wherein X represents a group of the formula:

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

a group of the formula: ,

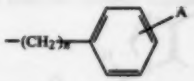
a group of the formula: or

-continued

a group of the formula: ;

Z represents a hydrogen atom or a group of the formula:

wherein R represents (1) alkyl of 1 to 16 carbon atoms, (2)



wherein n is an integer of 0–2 and A is H, methyl, methoxy or chlorine, (3) cyclopentyl, (4) cyclohexyl, (5) alkenyl of up to 16 carbon atoms, (6) cinnamoyl, (7) pyridyl or (8)

wherein $R_1$ is alkyl of up to 10 carbon atoms or cyclohexyl, and Y represents (1) alkyl of 1–6 carbon atoms, (2) phenyl, (3) phenyl substituted by methyl, methoxy, chlorine or trifluoromethyl, (4) pyridyl, (5) pyridyl substituted by methyl, methoxy or chlorine, (6) pyrimidyl, (7) pyrimidyl substituted by methyl or methoxy or (8) benzothiazolyl; and m represents an integer of 2 or 3, or a pharmaceutically acceptable salt thereof.

43. A method for treating diabetes which comprises administering to a patient suffering from diabetes an effective amount of a carboximide derivative or a pharmaceutically acceptable salt thereof according to claim 1.

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**4,479,955**

## HETEROCYCLE-FUSED PYRAZOLO[3,4-D]PYRIDIN-3-ONES AS BENZODIAZEPINE RECEPTOR MODULATORS

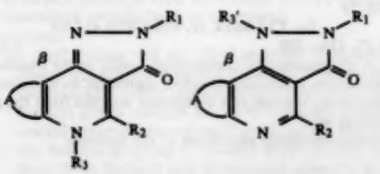
**Naokata Yokoyama, Cliffside, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jan. 10, 1983, Ser. No. 457,105**

**Int. Cl.**[3] **A61K** *31/505, 31/47;* **C07D** *471/14*

**U.S. Cl. 424—251** **14 Claims**

1. A compound of formula IA or IB



(IA) (IB)

wherein

A together with the two carbon atoms to which it is attached represents fused 2,3-, 3,4- or 4,3-pyrido wherein

the carbon atoms forming said rings are unsubstituted or one or two are substituted by lower alkyl, lower alkoxy or halogen;

$R_1$ represents phenyl, or phenyl mono- or disubstituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl; or $R_1$ represents an aromatic heterocyclic radical selected from pyridyl, quinolyl, isoquinolyl, pyrimidyl and thiazolyl, or any said heterocyclic radical mono- or di-substituted by lower alkyl, lower alkoxy or halogen;

$R_2$, $R_3$ and $R_3'$ independently represent hydrogen or lower alkyl; or a tautomer thereof; or a pharmaceutically acceptable salt thereof.

14. A method for treating nervous system diseases responsive to benzodiazepine receptor modulation in mammals which comprises administering to a mammal in need thereof an effective amount of a compound of claim 1 or a pharmaceutical composition comprising an effective amount of said compound in combination with one or more pharmaceutically acceptable carriers.

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4,479,956

## ANALGESIC COMPOSITIONS COMPRISING PROPIRAM AND METHODS OF USING SAME

**Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.**

**Filed Apr. 26, 1983, Ser. No. 488,815**

**Int. Cl.³ A61K *31/44, 31/52***

**U.S. Cl. 424—253** **16 Claims**

1. A pharmaceutical composition of matter for use in eliciting an analgesic response in a mammal, said composition comprising an analgesically effective amount of propiram and an amount of caffeine sufficient to hasten the onset of the analgesic response.

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4,479,957

## USE OF VINDESINE IN TREATING ACUTE LYMPHATIC LEUKEMIA AND OTHER SUSCEPTIBLE NEOPLASMS

**George J. Cullinan, Trafalger, and Koert Gerzon, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation of Ser. No. 101,335, Dec. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 935,828, Aug. 22, 1978, abandoned, which is a division of Ser. No. 828,693, Aug. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 721,650, Sep. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 539,681, Jan. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 446,869, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 347,275, Apr. 2, 1973, abandoned. This application Apr. 2, 1981, Ser. No. 250,459**

**Int. Cl.³ A61K *31/475***

**U.S. Cl. 424—262** **5 Claims**

3. The method of treating neoplasms which comprises administering to a mammal suffering from a vindesine-susceptible neoplasm selected from the group consisting of acute lymphatic leukemia, acute granulocytic leukemia, chronic myeloid leukemia, non-small cell lung cancer, Hodgkin's disease, non-Hodgkin's lymphoma, malignant melanoma, carcinoma of the breast, esophageal carcinoma and testicular carcinoma an anti-neoplastically-effective amount of vindesine or a pharmaceutically-acceptable acid addition salt thereof.

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4,479,958

## METHODS AND COMPOSITIONS FOR INHIBITING HERPES VIRUS USING PYRIDINYL KETONES

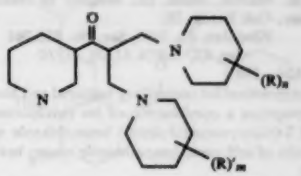
**Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Sep. 13, 1978, Ser. No. 942,100**

**Int. Cl.³ A61K *31/455***

**U.S. Cl. 424—266** **5 Claims**

1. A method for treating herpes virus infections in a mammal infected with herpes virus which comprises administering to said mammal an effective virus inhibiting amount of a pyridinyl ketone or a pharmaceutically-acceptable salt thereof, said pyridinyl ketone corresponding to the formula



wherein R and R' independently represent a lower alkyl having from 1 to about 3 carbon atoms; n and m independently represent the integer 0 or 1.

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4,479,959

## PROCESS FOR INDUCING HYPNOSIS

**Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation of Ser. No. 229,380, Jan. 29, 1981, abandoned, which is a continuation of Ser. No. 125,615, Feb. 28, 1980, abandoned, which is a continuation of Ser. No. 026,938, Apr. 4, 1979, abandoned, which is a continuation of Ser. No. 910,561, May 30, 1978, abandoned, which is a continuation of Ser. No. 821,590, Aug. 4, 1977, abandoned, which is a continuation of Ser. No. 729,295, Oct. 4, 1976, abandoned, which is a continuation of Ser. No. 284,161, Aug. 28, 1972, abandoned. This application Jul. 28, 1982, Ser. No. 402,460**

**The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.**

**Int. Cl.³ A61K *31/41***

**U.S. Cl. 424—269** **4 Claims**

1. A process for inducing sleep comprising the administration to a human or animal subject in need of sleep, in unit dosage form from about 0.005 mg. to about 0.2 mg./kg. body weight of 8-chloro-1-hydroxymethyl-6-phenyl-4H-s-triazolo[4,3-a][1,4]-benzodiazepine or a pharmacologically acceptable acid addition salt acetate or hydrogen succinate, ester, or (5) N-oxide thereof in association with a pharmaceutical carrier.

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4,479,960

## ANTHELMINTHIC POUR-ON VETERINARY COMPOSITION

**Peter J. Brooker, and John Goose, both of Saffron Walden, England, assignors to Bayer AG, Bayerwerk, Fed. Rep. of Germany**

**Division of Ser. No. 327,742, Dec. 4, 1981, Pat. No. 4,414,222, which is a division of Ser. No. 832,916, Sep. 13, 1977, Pat. No. 4,336,262, which is a division of Ser. No. 773,111, Feb. 28, 1977, Pat. No. 4,070,467, which is a continuation of Ser. No. 443,552, Feb. 19, 1974, abandoned. This application Aug. 12, 1983, Ser. No. 522,730**

**Claims priority, application United Kingdom, Feb. 23, 1973, 8972/73; Jan. 25, 1974, 3521/74**

**Int. Cl.³ A61K *31/425***

**U.S. Cl. 424—270** **17 Claims**

1. A pour-on veterinary composition useful for the treatment of helminthic infestations in animals, which consists essentially of an anthelminthically effective amount of tetramisole or levamisole or a non-toxic acid addition salt thereof in combination with one or more of paraffins of 6 to 20 carbon atoms, halogenated aliphatic hydrocarbons, ketones, ethers, amides, sulphones or sulphoxides, as a diluent suitable for pour-on therapy.

## 4,479,961
## SYNERGISTIC FUNGICIDE/BIOCIDE OF 2-(THIOCYANOMETHYLTHIO) BENZOTHIAZOLE AND BIS (TRICHLOROMETHYL) SULFONE

**Cynthia H. Martin, Joliet, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Jan. 23, 1984, Ser. No. 573,264**
**Int. Cl.³ A01N *31/00, 41/10***
**U.S. Cl. 424—270** **17 Claims**

1. A composition for controlling bacterial and fungal growth which comprises a combination of bis (trichloromethyl) sulfone and 2-(thiocyanomethylthio) benzothiazole wherein the weight ratio of sulfone to benzothiazole ranges between 10/90 to 90/10.

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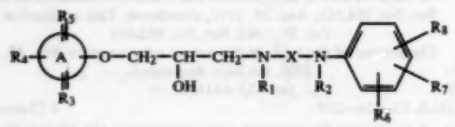
## 4,479,962
## INDAZOLOXYPROPANOLAMINE DERIVATIVES AND USE IN COMBATING, AND FOR THE PROPHYLAXIS OF, CARDIAC AND CIRCULATORY DISEASES

**Fritz Wiedemann, Weinheim-Lützelsachsen; Helmut Michel, Mannheim; Wolfgang Weckerle, Grünstadt; Egon Roesch, Mannheim, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany**

**Filed Aug. 2, 1982, Ser. No. 403,968**
**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131146**
**Int. Cl.³ C07D *231/56*; A61K *31/415***
**U.S. Cl. 424—273 N** **32 Claims**

1. Indazoloxypropanolamine of the formula:



wherein

A is indazole, or partly hydrogenated indazole X is a straight-chained or branched alkylene chain containing 2 to 6 carbon atoms,

$R_1$ and $R_2$, which can be the same or different, are hydrogen atoms or lower alkyl or benzyl radicals,

$R_3$, $R_4$ and $R_5$, which can be the same or different, are hydrogen atoms or lower alkyl, benzyl, formyl, lower alkanoyl, cyano, hydroxymethyl, lower alkoxycarbonyl or carbamoyl radicals or the divalent substituents sulfur or oxygen and

$R_6$, $R_7$ and $R_8$, which can be the same or different, are hydrogen or halogen atoms, lower alkyl, nitro, amino, lower alkylthio or lower alkoxy radicals or

$R_6$ and $R_7$ together represent an optionally unsaturated trimethylene chain;

and the pharmacologically acceptable salts thereof.

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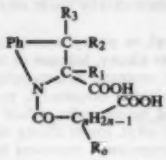
## 4,479,963
## 1-CARBOXYALKANOYLINDOLINE-2-CARBOXYLIC ACIDS

**Norbert Gruenfeld, White Plains, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 235,294, Feb. 17, 1981, Pat. No. 4,374,847, which is a continuation-in-part of Ser. No. 200,706, Oct. 27, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,700**
**The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.**
**Int. Cl.³ A61K *31/40*; C07D *209/42***
**U.S. Cl. 424—274** **15 Claims**

1. A mono- or bis-functional derivative of an indoline-2-carboxylic acid of the formula I



(I)

wherein Ph is unsubstituted 1,2-phenylene, or 1,2-phenylene substituted by one to three identical or different members selected from lower alkyl, lower alkoxy, lower alkylenedioxy, hydroxy, halogeno and trifluoromethyl; $R_o$ is hydrogen or HPh; each of $R_1$, $R_2$ and $R_3$ is hydrogen or lower alkyl; and n is an integer from 2 to 8;

said derivative selected from a lower alkylene amide wherein the lower alkylene group together with the amide nitrogen forms a 5-, 6-or 7-membered ring, or a said lower alkylene amide substituted on the ring by hydroxy-(lower-)alkyl or by lower alkanoyloxy-(lower) alkyl; an α-(lower)-carboalkoxy- or α-carboxy-substituted lower alkylamide; an α-(lower)carboalkoxy- or α-carboxy-substituted aryl-(lower) alkylamide in which aryl represents phenyl or 3-indolyl; an (amino or carbobenzyloxyamino)-(lower) alkylamide; an aryl-(lower)alkyl ester in which aryl represents phenyl or pyridyl; a lower alkanoyloxy-(lower) alkyl ester; a 3-phthalidyl ester; a (hydroxy, lower alkanoyloxy, or lower alkoxy)-substituted (lower)alkoxymethyl ester; a bicycloalkyloxycarbonyl-(lower)alkyl ester having up to 10 carbon atoms in the bicycloalkyl group in which bicycloalkyl represents unsubstituted or lower alkyl substituted bicyclo[2,2,1]heptyl; or a pharmaceutically acceptable salt thereof.

14. An antihypertensive or cardioactive pharmaceutical composition comprising a correspondingly effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

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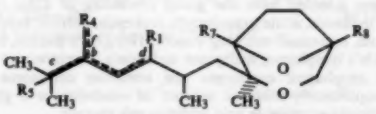
## 4,479,964
## OXEPANES AND PROCESSES THEREFOR

**Ramesh M. Kanojia, Somerville; Michael P. Wachter, Bloomsbury, and Robert H. K. Chen, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Continuation of Ser. No. 29,231, Apr. 11, 1979, abandoned, which is a division of Ser. No. 903,456, May 8, 1978, Pat. No. 4,176,188, which is a division of Ser. No. 742,940, Nov. 18, 1976, Pat. No. 4,102,895. This application Apr. 24, 1981, Ser. No. 256,879**
**Int. Cl.³ A61K *31/335*; C07D *319/10***
**U.S. Cl. 424—278** **12 Claims**

1. A compound selected from the group consisting of:

IV



wherein $R_1$ is —XY·wherein X is hydrogen or hydroxy provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; trialkylsilyloxy; —OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl, and substituted phenyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; a sulfate, nitrate or phosphate radical; thiol; alkylthio; phenylthio and substituted phenylthio wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; halo; amino; alkylamino; dialkylamino; phenylamino

and substituted phenylamino wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; and the quaternary ammonium and acid addition salts thereof, acylamino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms or from benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl, substituted benzyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; phenyl; substituted phenyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; and $R_1$ is oxo; thioxo; hydroxyimino; alkoxyimino; phenyloxyimino and substituted phenyloxyimino wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; acyloxyimino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms or from benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo, or lower alkyl having 1–5 carbon atoms; hydrazono; alkylhydrazono; phenylhydrazono or substituted phenylhydrazono wherein the substituent is halo, nitro and lower alkyl having 1–5 carbon atoms; phenylsulfonylhydrazono or substituted phenylsulfonylhydrazono wherein the substituent is halo, nitro, or lower alkyl having 1–5 carbon atoms; carbamoylhydrazono; dialkoxy; methylenyl; alkylidenyl; alkylimino; or phenylimino and substituted phenylimino wherein the substituent is halo, nitro, or lower alkyl having 1–5 carbon atoms;

$R_4$ is hydrogen; methyl or methylenyl;

$R_5$ is hydrogen; hydroxy; hydroperoxy or —OCOR‴ wherein R‴ is lower alkyl;

$R_7$ is hydrogen; hydroxy; lower alkoxy; or —OCOR‴ wherein R‴ is lower alkyl;

$R_8$ is —COOH and the ammonium and alkali metal and alkaline earth metal salts thereof; $—CH_2OH$; —CHO; cyano; and —COOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl and substituted phenyl wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; —COCl or $—CONH_2$.

**11.** A method of interrupting pregnancy which comprises administering to female animals a pregnancy interrupting effective amount of a compound of claim **1** in a pharmaceutically acceptable carrier.

**12.** A method of inducing uterine contractions which comprises administering to a female animal a uterine contraction inducing effective amount of a compound of claim **1** in a pharmaceutically acceptable carrier.

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**4,479,965**

## M-4 AND ISOM-4 DERIVATIVES THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

**Akira Terahara, and Minoru Tanaka, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan**

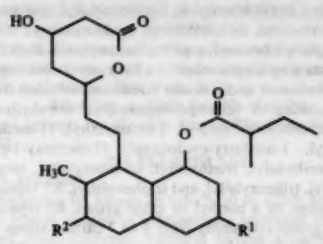
**Filed Apr. 28, 1982, Ser. No. 372,696**

**Claims priority, application Japan, May 7, 1981, 56-68646**

**Int. Cl.**[3] **C07D** *309/30*; **A61K** *31/365*

**U.S. Cl. 424—279** **10 Claims**

**1.** The tetrahydro-M-4 or tetrahydro-IsoM-4 compound of formula (I):



(I)

wherein one of $R^1$ and $R^2$ represents a hydrogen atom and the other represents a hydroxy group.

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**4,479,966**

## 6,9-METHANO-PGI2 ANALOGUES

**Masaki Hayashi; Yoshitaka Konishi, both of Takatsuki, and Yoshinobu Arai, Toyonaka, all of Japan, assignors to Ono Pharmaceutical Company, Ltd., Osaka, Japan**

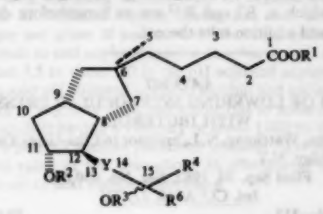
**Division of Ser. No. 025,096, Mar. 29, 1979, abandoned. This application Jan. 21, 1980, Ser. No. 113,502**

**Claims priority, application Japan, Mar. 31, 1978, 53-037952; Nov. 10, 1978, 53-137867**

**Int. Cl.**[3] **C07C** *177/00, 59/46*; **A01K** *31/557*

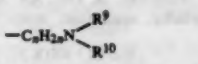
**U.S. Cl. 424—305** **40 Claims**

**1.** A prostaglandin $I_2$ analogue of the formula:



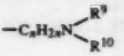
(II)

wherein the symbol between the carbon atoms in positions 5 and 6 represents a single or double bond, Y represents ethylene or trans-vinylene, $R^1$ represents a hydrogen atom, a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, ar aralkyl group containing from 7 to 12 carbon atoms, a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, a phenyl group unsubstituted or substituted by at least one chlorine atom, trifluoromethyl group, alkyl group containing from 1 to 4 carbon atoms or phenyl group, a $—C_mH_{2m}COOR^7$ group, wherein m represents an integer of from 1 to 12 and $R^7$ represents a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, a $—C_nH_{2n}OR^8$ group, wherein n represents an integer of from 2 to 12 and $R^8$ represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, or a



group, wherein $R^9$ and $R^{10}$, which may be the same or different, each represents a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms and n is as hereinbefore defined, $R^2$ represents a hydrogen atom or a hydroxy-protecting group which is eliminated under acidic or alkaline conditions selected from the group consisting of tetrahydropyran-2-yl, tetrahydrofuran-2-yl, tetrahydrothiopyran-2-yl, 1-ethoxyethyl, (1-methoxy-1-methyl)ethyl, 1-methoxycyclohexyl,

(1-methoxy-1-phenyl)ethyl, trimethylsilyl, triethylsilyl, tri-n-butylsilyl, tert-butyldimethylsilyl, tribenzylsilyl, triphenylsilyl, acetyl, chloroacetyl, dichloroacetyl, trichloroacetyl, trifluoroacetyl, propionyl, benzoyl, p-phenylbenzoyl, and naphthyloyl, $R^3$ represents a hydrogen atom or a hydroxy-protecting group which is eliminated under acidic conditions selected from the group consisting of tetrahydropyran-2-yl, tetrahydrofuran-2-yl, tetrahydrothiopyran-2-yl, 1-ethoxyethyl, (1-methoxy-1-methyl)ethyl, 1-methoxy-cyclohexyl, (1-methoxy-1-phenyl-)ethyl, trimethylsilyl, triethylsilyl, tri-n-butylsilyl, tert-butyldimethylsilyl, tribenzylsilyl, and triphenylsilyl, $R^4$ represents a hydrogen atom or a methyl or ethyl group, $R^6$ represents a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group containing from 1 to 8 carbon atoms, the wavy line attached to the carbon in position 15 represents $\alpha$- or $\beta$-configuration or a mixture thereof and when represents a double bond, the double bond between $C_5$–$C_6$ is E, Z or a mixture thereof, and when represents a single bond, the absolute configuration of $C_6$ is R, S or a mixture thereof and, when $R^2$ and $R^3$ represent hydrogen atoms, cyclodextrin clathrates of such acids and esters and, when $R^1$, $R^2$ and $R^3$ represent hydrogen atoms non-toxic salts thereof and, when $R^1$ represents a



group in which n, $R^9$ and $R^{10}$ are as hereinbefore defined, non-toxic acid addition salts thereof.

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**4,479,967**

**METHOD OF LOWERING INTRAOCULAR PRESSURE WITH IBUTEROL**

**Max Wilhelm, Watchung, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Sep. 30, 1982, Ser. No. 430,642**
**Int. Cl.³ A61K *31/225***
**U.S. Cl. 424—313** **10 Claims**

1. An intraocular pressure lowering ophthalmic pharmaceutical composition for topical application to the eye of a mammal comprising a sterile isotonic aqueous solution of pH 5–8 comprising about 0.025 to 0.5% of 2-tert-butylamino-1-(3,5-diisobutyryloxyphenyl)-ethanol or an ophthalmically acceptable salt thereof in combination with an ophthalmically acceptable buffering agent as required to maintain pH, an effective concentration of an ophthalmically acceptable preservative and an ophthalmically acceptable neutral salt for adjusting osmotic pressure as required to render the solution isotonic.

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**4,479,968**

**CONTROL OF ECTOPARASITIC INFESTATIONS OF PIGS**

**William B. Hyman, Kempton Park; John Hoy, Johannesburg, and Philippus J. van Rensburg, Randburg, all of South Africa, assignors to The Wellcome Foundation Ltd., London, England**

**Filed Sep. 28, 1981, Ser. No. 306,327**
**Claims priority, application South Africa, Oct. 17, 1980, 80/6408**
**Int. Cl.³ A61K *31/135***
**U.S. Cl. 424—330** **7 Claims**

1. A method for control of ectoparasitic infestations of pigs, consisting essentially of the topical application to a localized area of the pig's body surface of a pesticidal composition consisting essentially of an aliphatic hydrocarbon oil as the only organic hydrocarbon oil and a nonsystemic acting pesticidal compound selected from the class consisting of organochlorine, organophosphate, pyrethroid and formamidine compounds.

**4,479,969**

**USE OF LACTOSE-HYDROLYZED WHEY IN CHEWING GUM**

**Abraham I. Bakal, Parsippany, N.J., and Tommy L. Crossman, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Mar. 7, 1983, Ser. No. 472,734**
**Int. Cl.³ A23G *3/30***
**U.S. Cl. 426—3** **18 Claims**

1. A chewing gum which comprises:
(a) a gum base component;
(b) a sweetening, plasticizing, and emulsifying component comprising from about 0.5 to about 60 percent by weight of a whey or a whey fraction which has a protein content of from about 2 to about 90 percent on a dry weight basis, and which has been lactose hydrolysed such that at least about 30 percent of the lactose, content of from about 5 to about 85 percent on a dry weight basis, has been hydrolyzed; and
(c) a soluble sweetener component, and a flavoring component, as required.

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**4,479,970**

**PROCESS FOR REMOVING NATURAL COLORANTS FROM WINE**

**Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Apr. 15, 1983, Ser. No. 485,477**
**Int. Cl.³ A23B *7/00*; C12G *1/00, 1/02***
**U.S. Cl. 426—253** **5 Claims**

1. A process for reducing the color of a wine comprising:
(a) immobilizing gelatin to form an insoluble composite;
(b) contacting wine or a wine precursor fluid selected from grape juice or grape must with the immobilized gelatin composite; and
(c) separating the fluid from the insoluble composite.

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**4,479,971**

**GLYCERIDE FAT BASED CLOUDS FOR READY-TO-DRINK BEVERAGES**

**Jean L. Eng, Ottawa, and Kathleen M. Mackenzie, Ajax, both of Canada, assignors to General Foods Inc., Ontario, Canada**

**Filed Nov. 4, 1982, Ser. No. 439,006**
**Int. Cl.³ A23L *2/00, 2/02, 3/34***
**U.S. Cl. 426—330** **18 Claims**

12. A method of producing a bland, colorless, glyceride fat based clouding emulsion comprising:
(a) forming a solution or dispersion of 10% to 30% by weight gum arabic in water and heating said solution or dispersion above 40° C. to 65° C.;
(b) heating a glyceride fat selected from the group consisting of soy stearin and cocoa butter to a temperature above 40° C. to 65° C.;
(c) combining the solution or dispersion of gum arabic of step (a) with the heated glyceride fat of step (b) in amounts wherein the gum arabic to glyceride fat ratio from 3:1 to 5:1 by weight;
(d) emulsifying the combination of step (c) by subjecting the combination to homogenization pressures of from 3,000 to 7,000 psig.

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**4,479,972**

**FLAVOR AND MOUTHFEEL CHARACTER IN FOODSTUFFS BY THE ADDITION OF BITTER PRINCIPLES**

**Robert J. Soukup, and Thomas H. Parliment, both of New City, N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Jun. 30, 1982, Ser. No. 394,035**
**Int. Cl.³ A23L *2/38, 1/04***
**U.S. Cl. 426—536** **17 Claims**

1. A method of producing an enhanced flavor impact and an

improved mouthfeel character in a lemon-flavored, lemonade-flavored, or orange-flavored foodstuff comprising the addition of a citrus bittering agent selected from the group consisting of limonin, nomilin, naringin and combinations thereof in an amount of from 0.1 ppm to 50 ppm on an as-consumed basis.

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4,479,973

## GELLED MILK COMPOSITIONS

**Edward J. Holley, Banbury, England, assignor to General Foods Limited, Banbury, England**

**Filed Feb. 16, 1983, Ser. No. 466,984**
**Int. Cl.³ A23L *1/04***
**U.S. Cl. 426—573** **7 Claims**

1. A UHT processed physically stable gelled milk composition comprising the following by weight:

| | |
|---|---|
| Milk | 80–94.1% |
| Sugar | 5–10% |
| Dried Fat Emulsion | 0.0–10% |
| Modified Starch | 0.5–3% |
| Gum Blend | |
| Iota-carrageenan | 0.15–0.5% |
| Xanthan gum | 0.0–0.5% |

herein the gum blend further comprises a component selected from the group locust bean gum, 0.0–0.2% and guar gum 0.0–0.2%, with gelatin, 0.0–0.5% and said gum blend is at least 0.1%, by weight, of said composition.

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4,479,974

## AMINO ACIDS AS DRY BEVERAGE MIX INGREDIENTS

**Anne F. Schenz, Haworth, N.J., assignor to General Foods Corporation, White Plains, N.Y.**

**Filed Oct. 19, 1982, Ser. No. 435,162**
**Int. Cl.³ A23L *2/00***
**U.S. Cl. 426—590** **16 Claims**

1. A method of producing an enhanced flavor impact and improved mouthfeel character in a fruit-flavored beverage which consists essentially of combining with a sugar-sweetened fruit-flavored beverage, an amino acid selected from the group consisting of l-proline, l-asparagine, l-aspartic acid, l-arginine, γ-amino-n-butyric acid, l-alanine, l-glutamine and combinations thereof in an effective amount sufficient to produce an enhanced flavor impact and improved mouthfeel character.

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4,479,975

## FRUIT FLAVORED BEVERAGES

**Alina S. Szczesniak, Mt. Vernon, N.Y., and Anne F. Schenz, Haworth, N.J., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Jan. 13, 1983, Ser. No. 457,816**
**Int. Cl.³ A23L *2/00***
**U.S. Cl. 426—590** **12 Claims**

1. A method for producing an acidic fruit-flavored beverage with an enhanced flavor impact and improved mouthfeel character comprising the addition of a protein hydrolyzate to said beverage, said protein hydrolyzate being bland, possessing no appreciable off-flavors or off-odors and said hydrolyzate being soluble in water a pH 2.5 to 4, said hydrolyzate being present in amounts from about 0.1 to about 1 gram per liter on an as-consumed basis.

4,479,976

## HARDENED BUTTERFAT IN MARGARINE FAT BLENDS

**Gabriël J. T. Lansbergen, 's-Gravezande, and Josephus M. A. Kemps, Udenhout, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.**

**Filed Sep. 1, 1982, Ser. No. 413,904**
**Claims priority, application United Kingdom, Sep. 9, 1981, 8127262**
**Int. Cl.³ A23D *5/00***
**U.S. Cl. 426—607** **1 Claim**

1. Margarine fat blends, in which 10 to 100% by weight of the fat blends consist of substantially saturated triglycerides obtained from hardened butterfat having a carbon number preselected for margarine fat blends ranging from 24–42, which comprise 2 fatty acid residues having each 16 carbon atoms or more and 1 fatty acid residue having 2 to 8 carbon atoms.

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4,479,977

## METHOD OF PREPARING HEAT RESISTANT LECITHIN RELEASE AGENT

**Gregory L. Dashiell, and William E. Prosise, both of Fort Wayne, Ind., assignors to Central Soya Company, Inc., Fort Wayne, Ind.**

**Filed Dec. 30, 1982, Ser. No. 454,846**
**Int. Cl.³ A23J *7/02*; A23D *5/00***
**U.S. Cl. 426—609** **4 Claims**

1. A method of preparing a lecithin-based release product comprising acylating lecithin with an organic anhydride to provide an acylated lecithin having less than about 1.2 mg nitrogen per gram of said acylated lecithin, adding an alkali hydroxide to said acylated lecithin to achieve a pH in the range of about 7.5 to about 9.0 in the pH adjusted acylated lecithin, drying said pH adjusted acylated lecithin and adding thereto a mixture of soy fatty acids and edible oils to achieve a visually clear product having a viscosity of about 1,000 to 10,000 centipoise, a percent acetone insolubles of about 50 to about 66 and an acid value of less than about 36 effective to increase the resistance to heat induced darkening.

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4,479,978

## BALANCED FEEDINGSTUFFS FOR RUMINANTS, AND THE METHOD FOR THEIR PRODUCTION

**Andrea Robertiello, Rome; Leonello Angelini, Monterotondo, and Ludwig Degen, Rome, all of Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy**

**Filed Jan. 28, 1982, Ser. No. 343,465**
**Claims priority, application Italy, Feb. 13, 1981, 19718 A/81**
**Int. Cl.³ A23K *1/00***
**U.S. Cl. 426—636** **3 Claims**

1. A method of producing a nutritionally balanced feedingstuff for ruminants, said method consisting essentially of combining alkali treated straw in an amount effective to balance up to 60% of concentrated desalinated spent sugarbeet pulp said feedingstuff also containing added corn meal and dicalcium phosphate.

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4,479,979

## METHOD FOR INDICATING AN INSUFFICIENT LEVEL OF YARN FINISH

**James M. Prober, Centreville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 19, 1983, Ser. No. 563,051**
**Int. Cl.³ B05D *7/00*; G01K *13/00***
**U.S. Cl. 427—9** **2 Claims**

1. The method of indicating a lower level of finish on a yarn than an essentially constant level applied to the yarn, said essentially constant level being represented by a set point amplitude, said method comprising: passing the yarn over a stationary-surfaced machine element; measuring the temperature of said machine element; generating a signal proportional

to said temperature; comparing the amplitude of said signal to said set point amplitude; and signalling when said signal amplitude exceeds said set point amplitude, thereby indicating a lower level of finish than said essentially constant level.

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4,479,980

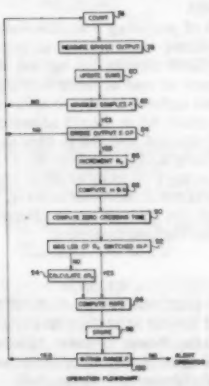
## PLATING RATE MONITOR

Raul E. Acosta, White Plains, and Edward J. Yarmchuk, Purdys, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,390

Int. Cl.³ C23C 3/00, 3/02

U.S. Cl. 427—10 14 Claims



10. In a method for continuously monitoring a plating process with a Wheatstone bridge comprising:

first and second resistor branches of substantially identical resistive characteristics connected across bridge input terminals;

variable resistor means connected in circuit as a third bridge branch;

a fixed resistor connected in circuit as a fourth bridge branch, the third and fourth branches connected across the input terminals;

bridge output terminals defined

(a) between the first and second branches and

(b) between the third and fourth branches,

the method including the steps:

subjecting only the first and second branches to an environment in which an object undergoes plating;

measuring the bridge output voltage as plating progresses;

detecting the instant when the bridge becomes substantially balanced;

incrementing the variable resistor means by a preselected amount for unbalancing the bridge as plating of the first branch and the object continues;

measuring the time interval between successive balanced bridge conditions;

calculating the plating thickness change during each interval in accordance with the equation:

$$\text{thickness change} = k \times \Delta R_v / R_f$$

where

k = a constant;

$\Delta R_v$ = the incremental increase of the variable resistor means; and

$R_f$ = fixed resistor value;

and wherein the plating rate is computed as a function of thickness change during an interval divided by the elapsed time of the interval.

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4,479,981

## WATER-BORNE HARD COATING COMPOSITIONS AND PROCESSES THEREFOR

Jonathan K. Winters, Portsmouth, Ohio, and Fred B. Savell, III, Mobile, Ala., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 3, 1982, Ser. No. 374,467

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.³ C04B 9/02; B05D 1/08, 1/20, 1/00

U.S. Cl. 427—27 41 Claims

1. An anti-corrosive, storage stable, rapidly drying, emulsified oil in water and water reducible and dispersible coating composition having a pH in the range of 7.0 to 10, and capable of application and flow on a solid substrate, comprising:

(a) about 0.5 to 30% by weight of organic wax components having a melting point above about 50° C.; said wax containing ester groups;

(b) about 0 to 30% of a polyol ester derived from the polyester of one of:

stearic acid, isostearic acid, oleic acid and lanolinic acid, and a polyol selected from the group consisting of:

neopentyl glycol, trimethylol propane, pentaerythritol and dipentaerythritol;

(c) about 0.5 to 6% of a surfactant;

(d) about 10 to 30% of a coupling agent, comprising a $C_5$–$C_{30}$ liquid hydrocarbon coupling component and $C_2$–$C_{20}$ alcohol in a ratio of between 1:1 and 10:1 by weight, respectively, selected from the group consisting of:

mineral spirits, kerosene, 140-solvent, ethylene glycol ether, butyl cellosolve, diethylene glycol monoethyl ether, ethylene glycol monopropyl ether, propyl cellosolve, ethyl cellosolve, diethylene glycol monoethyl ether, ethylene glycol monoacetate, diethylene glycol monoproprionate, diethylene glycol monoacetate, propylene glycol monoacetate, ethanol, isopropanol and isobutanol.

(e) about 30 to 97% of water.

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4,479,982

## METHOD FOR PRODUCING A LYOPHOBIC LAYER

Kenth Nilsson, Akersberga, Sweden, and Rolf Schulte, Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 486,004

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214804

Int. Cl.³ B05D 3/14

U.S. Cl. 427—41 6 Claims

1. A method of producing a lyophobic layer on surfaces of a jet-orifice carrier of a recording device functioning with fluid droplets, comprising:

positioning at least one jet-orifice carrier in an operational pressure-controllable glow discharge chamber having a means for producing a glow discharge therein, said means being connected to a controllable high-frequency energy source, said chamber being connected to a controllable source of a gaseous organic compound;

feeding said gaseous organic compound into said chamber; and

providing a high frequency energy in the range from about 0.1 to 30 megahertz to said means so that a high frequency/low pressure glow discharge occurs within said chamber and a lyophobic layer is directly produced on surfaces of said jet-orifice carrier.

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**4,479,983**

## METHOD AND COMPOSITION FOR APPLYING COATINGS ON PRINTED CIRCUIT BOARDS

**Bernd K. Appelt, Apalachin; George P. Schmitt, Vestal, and John F. Shipley, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 7, 1983, Ser. No. 456,231**
**Int. Cl.³ B05D** *3/06*
**U.S. Cl. 427—54.1** **25 Claims**

1. Method of forming a solder mask on a high density printed circuit board comprising:

(a) preparing a photopolymerizable composition consisting of a phenoxy resin, a thickening agent, a polyethylenically unsaturated compound, a photoinitiator, a solvent, and a reaction product of a monoethylenically unsaturated carboxylic acid with a material of the group consisting of bis-phenol A-based epoxy resins and epoxidized novolaks, and wherein the ingredients are mixed according to the viscosity of the composition required for a desired screenability and curability of said composition, and the desired thickness and hardness of the solder mask to be produced,

(b) screen printing said photopolymerizable composition onto a printed circuit board,

(c) blanket illuminating said applied composition in order to partially polymerize it to at least the point at which bleeding in of said applied composition is inhibited and resolution is retained, and

(d) baking said applied composition to complete the polymerization.

14. Composition for producing coatings on printed circuit boards consisting of a phenoxy resin, a thickening agent, a polyethylenically unsaturated compound, a photoinitiator, a solvent and a reaction product of a monoethylenically unsaturated carboxylic acid with a material of the group consisting of bis-phenol A-based epoxy resins and epoxidized novolaks.

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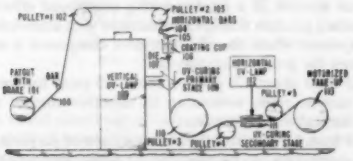
**4,479,984**

## RADIATION CURABLE MULTIFILAMENT COMPOSITE

**Nicha Levy, Atlanta, and Parbhubhai D. Patel, Dunwoody, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Dec. 27, 1982, Ser. No. 453,576**
**Int. Cl.³ B05D** *3/06*
**U.S. Cl. 427—54.1** **13 Claims**




1. A method of making a composite material comprising passing through a coating means at least one bundle comprising a multiplicity of filaments, thereby impregnating the bundle with a liquid material, and exposing at least a part of the impregnated portion of the bundle to actinic radiation to at least partially cure the liquid coating material, characterized in that the liquid coating material comprises:

(A) bisphenol-A-diglycidylether diacrylate resin; and optionally

(B) a urethane resin;

and further comprises at least one diluent selected from the group consisting of:

(I) a mixture of penta and quadradecylmethyleneglycol diacrylate;

(J) 1,10 decamethyleneglycol diacrylate;

(K) polyethyleneglycol (200) dimethacrylate.

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**4,479,985**

## METHOD FOR CLEANING AND CLEARING PLASTIC SURFACES

**Jefferson K. Allen, 10 Hall Ave., Nashua, N.H. 03060**

**Continuation of Ser. No. 973,400, Dec. 26, 1978, abandoned. This application Dec. 17, 1981, Ser. No. 331,489**
**Int. Cl.³ B05D** *5/06*
**U.S. Cl. 427—164** **7 Claims**

1. A method for cleaning and preventing clouding of transparent methylmethacrylate sheets which includes:

coating the surface of the sheet with a formulation which consists essentially of a non-volatile oil-monomer modified alkyd resin, the monomer selected from the group consisting of styrene, vinyl toluene, urethane and acrylic monomers; and a volatile solvent, the solvent being a petroleum distillate having a boiling point range between 150°–190° C., the non-volatile resin comprising 22–29% by weight of the formulation and the volume volatile solvent comprising 78–71% by weight of the formulation to form a clear film which prevents clouding of the acrylate sheet.

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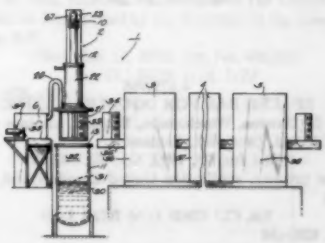
**4,479,986**

## IMPREGNATION OF METAL CASTINGS

**Thomas W. Juday, New Berlin, Wis., assignor to Imprex, Inc., Milwaukee, Wis.**

**Filed Jun. 9, 1983, Ser. No. 502,835**
**Int. Cl.³ B05D** *3/00;* **C23C** *13/08*
**U.S. Cl. 427—295** **12 Claims**



12. A method for impregnating metal castings with liquid sealant comprising the steps of:

(1) providing an impregnation vessel partially filled with liquid sealant,

(2) loading metal castings inside the vessel in a first position in which they are out of contact with the liquid sealant and then developing a vacuum inside the vessel while the castings are in the first position,

(3) moving the metal castings into the liquid sealant for impregnation therewith after a suitable vacuum has been developed inside the vessel,

(4) returning the castings to the first position after impregnation with liquid sealant,

(5) rotating the castings after being returned to the first position to remove excess liquid sealant therefrom, and

thereafter removing impregnated metal castings from the vessel for subsequent curing of the liquid sealant.

4,479,987

## PROCESS AND AN APPARATUS FOR STABILIZING FREE-FALLING LIQUID CURTAINS

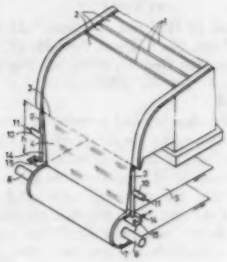
Günther Koepke, Odenthal; Hans Frenken, Odenthal-Osenau; Heinrich Bussmann, and Kurt Browatzki, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,817

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1983, 3300150

Int. Cl.³ B05D *1/34, 1/30*

U.S. Cl. 427—402 12 Claims



1. A process for stabilizing free-falling liquid curtains which comprise one or more layers, in the curtain coating of webs of objects advancing continuously past a coating station, characterized in that the free-falling curtain formed at the coating edge of a coater is laterally guided by the use of curtain holders from which an additional liquid issues towards and combines with the curtain, triangular stabilizing liquid bridges between the curtain and the curtain holders being formed from the coating edge to the point at which the curtain impinges on the layer support.

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4,479,988

## SPACER BAR FOR DOUBLE GLAZING

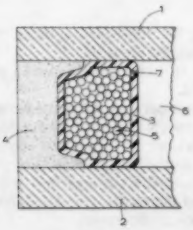
Charles D. Dawson, Winchcombe, England, assignor to Reddiplex Limited, Droitwich, England

Filed Jun. 28, 1982, Ser. No. 392,707

Claims priority, application United Kingdom, Jul. 2, 1981, 8120416

Int. Cl.³ E06B *3/24;* B32B *3/20*

U.S. Cl. 428—34 4 Claims



1. A spacer bar for double glazing comprising a hollow extrusion of polycarbonate material incorporating reinforcing filler of glass fibre.

4,479,989

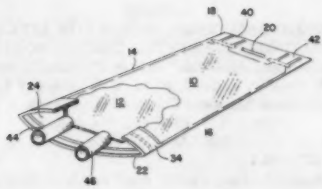
## FLEXIBLE CONTAINER MATERIAL

Mohan S. Mahal, Pleasant Hill, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 2, 1982, Ser. No. 446,303

Int. Cl.³ B32B *1/02;* B65D *65/38*

U.S. Cl. 428—35 14 Claims



1. A flexible film material, comprising:

(a) a first component of 30–90% linear low density polyethylene material having a density of 0.918–0.940 g/cm$^3$ and a melting point less than 125° C.;

(b) a second component of 10–70% of styrene-ethylenebutylene-styrene block copolymer;

(c) said components being selected and proportioned so that a flexible film container may be manufactured therefrom and sterilized at temperatures up to 120° C.

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4,479,990

## ARC AND TRACK RESISTANT ARTICLES UTILIZING PHOTOSENSITIVE SAG RESISTANT CYCLOALIPHATIC EPOXY RESIN COATING COMPOSITIONS

George D. Dixon, Needham, Mass.; Howard E. Saunders, Murrysville, Pa.; Smith A. Gause, Hampton, S.C., and Newton N. Goldberg, Penn Hills Township, Allegheny County, Pa., assignors to Westinghouse Electric Co., Pittsburgh, Pa.

Filed Jul. 30, 1982, Ser. No. 403,441

Int. Cl.³ C08K *3/10;* C08L *63/00;* H01B *3/40*

U.S. Cl. 428—36 20 Claims

1. A photosensitive, sag resistant, arc and track resistant composition consisting essentially of the admixture of:

(1) 100 parts by weight of a coating composition consisting essentially of:

(A) 100 parts by weight of a cycloaliphatic epoxy resin,

(B) about 30 to about 150 parts by weight of a flexibilizing agent for the epoxy resin, selected from the group consisting of polyazelaic polyanhydride, hexahydrophthalic anhydride and mixtures thereof,

(C) about 150 to about 290 parts by weight of a filler promoting arc and track resistance, and

(D) about 10 parts to about 75 parts by weight of $Al_2O_3$ as sole thixotroping agent, to which is added,

(2) an amount of a photosensitive compound effective to initiate gelation within the admixture with ultraviolet light exposure where the photosensitive compound is selected from the group consisting of:

(a) from about 1.0 part to about 4.0 parts by weight of acrylic resin, containing an effective amount of free radical photoinitiator,

(b) from 1.0 part to 3.0 parts by weight of polyester resin, containing an effective amount of free radical photoinitiator,

(c) from 1.0 part to 5.0 parts by weight of acryloureth ane resin, containing an effective amount of free radical photoinitiator,

(d) from 0.05 part to 8.0 parts by weight of polythiolene resin, containing an effective amount of free radical photoinitiator,

(e) from about 1.0 part to about 15.0 parts by weight of a

non-reactive plasticizer, containing an effective amount of cationic photoinitiator, and

(f) from about 0.05 part to about 3.0 parts by weight of cationic photoinitiator;

said photosensitive, sag resistant composition being characterized as resistant to sag upon application to a surface, and as having crack resistance and chemical and physical resistance to arced $SF_6$ upon cure.

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**4,479,991**

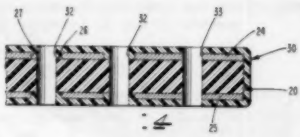
## PLASTIC COATED LAMINATE

**Fred E. Thompson, Quinton, Va., assignor to AT&T Technologies, Inc., New York, N.Y.**

**Filed Apr. 7, 1982, Ser. No. 366,431**

**Int. Cl.³ B32B *3/24***

**U.S. Cl. 428—76** **11 Claims**




1. A plastic coated laminate which comprises:

an electrically nonconductive board;

an integrally formed layer of metal bonded to and covering substantially one major surface of the board to produce a laminate substrate;

at least one relief hole formed through only the layer of metal with a solid surface portion of the one major surface exposed by the relief hole to form an imperforate base surface for the relief hole; and

a layer of plastic resin which encapsulates the laminate substrate, including the integrally formed layer of metal which covers substantially the one major surface of the board, and which is located in the relief hole and on the imperforate base surface to form a plastic coated laminate.

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**4,479,992**

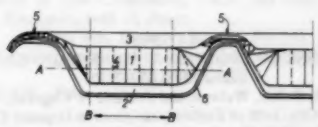
## SOUND ABSORBING STRUCTURAL ELEMENT

**Willy Häeseker, Albeim-Heinebach, Fed. Rep. of Germany; Robert Vignal, Gaillon/F/Moncient, and Guy Ferrand, Triel sur Seine, both of France, assignors to Matec Holding AG, Kusnacht, Switzerland**

**Continuation of Ser. No. 267,733, May 28, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,803**

**Int. Cl.³ B32B *3/12, 3/02***

**U.S. Cl. 428—116** **3 Claims**




1. A sound-absorbing self-supporting roof-liner for the sheet metal roofs of automotive vehicles comprising a support layer having covering layers on each of its two outer faces, at least one said covering layer being permeable to air, the support layer being an open-cell honeycomb structure of impregnated cardboard or craft paper with cells extending substantially traversely to the faces, a said air permeable layer comprising a nonwoven resin-bonded fibrous felt, one said layer being a decorative layer of textile material or porous PVC foil, said support layer together with its covering layers moulded to the contours of the sheet metal of a vehicle roof and compacted and shaped to less than the support layer thickness over a considerable part of its surface area thereby to conform to the functional shape of the surface facing the passenger compartment.

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**4,479,993**

## PATIENT SUPPORT MEANS

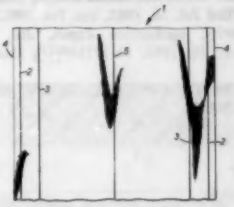
**David R. James, Tirley, England, assignor to James Industries Ltd., Gloucester, England**

**Filed Oct. 14, 1982, Ser. No. 434,237**

**Claims priority, application United Kingdom, Oct. 16, 1981, 8131349**

**Int. Cl.³ B32B *23/02***

**U.S. Cl. 428—193** **12 Claims**




1. Patient support means comprising a net, in or for a net bed, said net having a lengthwise extensibility of between 17% and 35% a widthwise extensibility of between 4% and 12% and a ratio of lengthwise to widthwise extensibilities of between 3 and 6, the net being manufactured from a heat-settable thermoplastics material which is heat set to provide satisfactory "memory" such that it does not take a substantially permanent set under normal patient loading.

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**4,479,994**

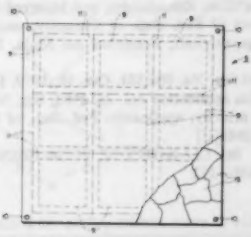
## WIDE BAND ENERGY ABSORBING CAMOUFLAGE BLANKET

**Richard M. Berg, Stafford, Va., assignor to The United States of America as Represented by the Secretary of the Army, Washington, D.C.**

**Filed May 18, 1983, Ser. No. 495,861**

**Int. Cl.³ B32B *5/18, 5/22***

**U.S. Cl. 428—195** **9 Claims**



1. A lightweight, foldable, wide band energy-absorbing camouflage blanket adaptable to be placed over operating equipment to absorb sound and heat emanating therefrom and to absorb radar waves incident thereon, said blanket comprising:

at least one sheet of heavy duty, abrasion-resistant fabric;

said fabric sheet being provided with a rows-and-columns matrix of individual laminated polygonal panels supported thereon;

said individual panels being of the Jaumann type comprising layers of diverse energy-absorbing materials arranged in

combination with each other and with said fabric sheet so as to absorb incident broad band radar waves, and to also absorb and reduce heat and sound emanating from protected equipment over and/or about which one or more of said blanket is placed; and

at least one exterior surface of said blanket fabric is characterized to provide visual camouflage according to predetermined tactical environments.

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4,479,995

## PLASTIC CARD HAVING METALLIC LUSTER

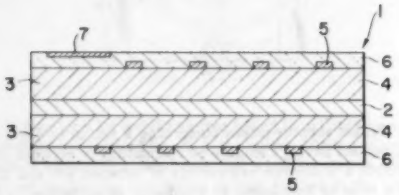
Norimoto Suzuki, and Fukuichiro Hayakawa, both of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha and Taihei Kagaku Seihin Kabushiki Kaisha, both of, Japan

Filed Jul. 16, 1982, Ser. No. 398,874

Claims priority, application Japan, Jul. 21, 1981, 56-108214[U]; Dec. 26, 1981, 56-197149[U]; Dec. 26, 1981, 56-197150[U]

Int. Cl.³ G09F 3/02; G03C 11/08

U.S. Cl. 428—203 10 Claims




1. A multilayer plastic card having metallic luster comprising:

a colored plastic sheet having a light transmission density of not less than 1.8;

metallic luster plastic sheets containing a metallic luster pigment with said metallic luster plastic sheets laminated on respective opposite surfaces of the colored plastic sheet; and

transparent plastic sheets laminated on respective outer surfaces of the metallic luster plastic sheets.

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4,479,996

## FORGERY-RESISTANT FILM AND METHOD OF USING SAME

Helmut Schäfer, Rüsselsheim, and Manfred Unger, Schlangenbad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 084,551, Oct. 15, 1979, Pat. No. 4,341,833. This application Jul. 28, 1981, Ser. No. 287,574

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 7832840[U]

Int. Cl.³ B32B 7/02, 27/36; G01N 21/02

U.S. Cl. 428—212 6 Claims

1. A method of marking an article to provide protection against forgery comprising the step of applying to the article to be marked a film comprising a laminate comprised of two transparent films joined to one another over their surface, each of said films being oriented by stretching and being comprised of a polyester resin and in admixture therewith an organic dyestuff which is heat stable at temperatures above about 260° C., wherein one of the laminated transparent film layers comprises as the dyestuff anthraceno [2, 1-m; 1,9 a-n; 9a, 9-a] thioxanthene and the other film layer comprises as the dyestuff N-(n-octadecyl)-benzo [k,1] thioxanthene-3,4-dicarboximide.

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4,479,997

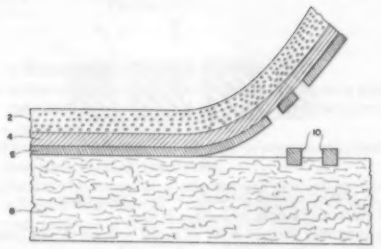
## ELECTRIC DISCHARGE FACSIMILE RECORDING MATERIAL

David C. Masterson, and Warren G. Van Dorn, both of Columbus, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 6, 1982, Ser. No. 395,100

Int. Cl.³ B32B 5/16; G01D 15/24

U.S. Cl. 428—212 17 Claims




1. An electric discharge transfer material comprising:

(a) an electrically anisotropic support layer having electroconductive particles dispersed in a resin matrix and having a volume resistance of at least $10^7$ ohm-cm and a surface resistance between about $10^5$ and about $10^{16}$ ohms per square;

(b) a conductive layer having first and second surfaces having a surface resistance of not more than $10^4$ ohms per square and a volume resistivity of not more than $10^2$ ohm-cm, wherein said support layer is disposed on said first surface of said conductive layer; and

(c) a transfer layer disposed on said second surface of said conductive layer comprising a hot melt resin having a melting point betweeen about 25° C. and 150° C. that is capable of melting and then separating from said second surface of said conductive layer and adhering to a receiving medium such that a desired pattern is formed on said receiving medium.

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4,479,998

## PROCESS OF PRODUCING FIBRE-REINFORCED SHAPED ARTICLES

Geoffrey R. Belbin, Welwyn, and Frederic N. Cogswell, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

Division of Ser. No. 341,185, Jan. 20, 1982, Pat. No. 4,399,085. This application Aug. 15, 1983, Ser. No. 523,058

Claims priority, application United Kingdom, Jan. 21, 1981, 8101822

Int. Cl.³ B29C 5/00; B29D 27/00; C08F 47/14

U.S. Cl. 428—220 4 Claims

3. An extruded, moulded, compacted, fibre-reinforced shaped sheet comprising a thermoplastic polymer and at least 50% by weight of fibres randomly and uniformly dispersed throughout the polymer, the length of at least 50% by weight of the fibres being in the range 10 mm–50 mm.

4. A shaped sheet as in claim 3 having a thickness up to 6 mm.

4,479,999

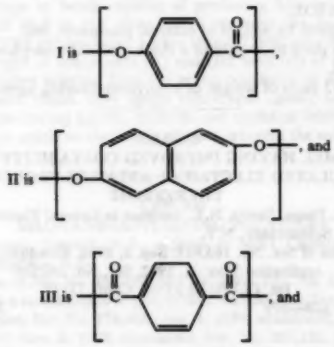
## FABRIC COMPRISED OF FUSIBLE AND INFUSIBLE FIBERS, THE FORMER COMPRISING A POLYMER WHICH IS CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE

Alan Buckley, Berkeley Heights, and Paul E. McMahon, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,491
Int. Cl.³ B32B 27/12, 27/36
U.S. Cl. 428—245 34 Claims

1. A fabric which exhibits thermal stability and chemical and solvent resistance comprised of fusible and infusible fibers, said fusible fibers being thermally bonded to said infusible fibers and comprised of a polymer which is capable of forming an anisotropic melt phase.

8. The fabric of claim 1 wherein said polymer comprises a melt processable wholly aromatic polyester which is capable of forming an anisotropic melt phase and consists essentially of the recurring moieties I, II, and III wherein:




wherein said polyester comprises approximately 30 to 70 mole percent of moiety I and wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, substituted phenyl, and mixtures thereof.

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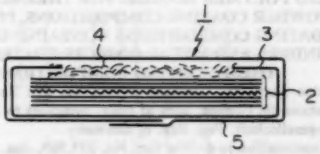
4,480,000

## ABSORBENT ARTICLE

Isao Watanabe; Toshinobu Kashiwada, both of Chiba; Hiroshi Suzuki, Sagamihara, and Junji Yoshii, Atsugi, all of Japan, assignors to Lion Corporation, Tokyo and Anne Company, Ltd., Kanagawa, both of, Japan

Filed Jun. 15, 1982, Ser. No. 388,632
Claims priority, application Japan, Jun. 18, 1981, 56-94178
Int. Cl.³ A61F 13/00
U.S. Cl. 428—284 6 Claims




1. An absorbent article comprising (1) an absorbent layer, (2) a barrier covering the lateral faces and underneath face of the absorbent layer, (3) a web placed on the top of the absorbent layer and (4) a nonwoven fabric wrapped around the absorbent layer, the barrier and the web, characterized in that said nonwoven fabric comprises, based on the weight of the nonwoven fabric, 10 to 70% by weight of a regenerated cellulose fiber, 5 to 60% by weight of a polyester fiber and 25 to 75% by weight of a heat-bondable composite polyolefin fiber, and said web is predominantly comprised of a polyester fiber.

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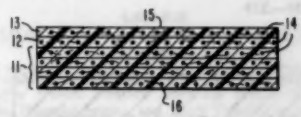
4,480,001

## ANTISTATIC LAMINATES CONTAINING METAL SALTS

Daniel L. Cannady, Jr., Allendale, and Halbert Mungin, Varnville, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,036
Int. Cl.³ B32B 3/00
U.S. Cl. 428—284 11 Claims




1. A static-dissipating laminate comprising:
(A) a bottom core layer, and
(B) a top decorative layer disposed on the core layer, where the core and decorative layers comprise fibrous material which is impregnated with a resin, and where at least the decorative layer has metal salt distributed therethrough, in an amount effective to provide a conductive path and to dissipate static charges accumulating on the top of the decorative layer.

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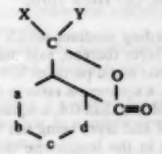
4,480,002

## DYESTUFF-CONTAINING MICROSCOPIC CAPSULE SUSPENSION FOR RECORD MATERIALS

Makoto Asano; Kiyoharu Hasegawa, both of Yokohama; Hiroyuki Akahori, Yokosuka, and Michihiro Tsujimoto, Tachikawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 326,005
Claims priority, application Japan, Dec. 12, 1980, 55-174659
Int. Cl.³ B32B 3/26
U.S. Cl. 428—402.2 3 Claims

1. Dyestuff-containing microscopic capsule suspension for record materials, which comprises in microscopic capsules a lactone family dyestuff having formula (I):




(I)

wherein a, b, c and d are each a carbon atom or either one or two atoms of said a, b, c and d are nitrogen atoms and the remaining atoms are carbon atoms, said a, b, c and d can have one or two substituent groups, adjacent a—b, b—c or c—d bond can form another ring, X and Y represent individually a benzene, naphthalene or aromatic heterocyclic ring which can include one or more subtituent groups, and X and Y can be the same or different and can be coupled together to form a ring; and a metal ion sequestering agent in the microscopic capsules or in a liquid medium wherein the capsules are suspended, the water-soluble and organic metal ion sequestering agent being ethylenediaminetetraacetic acid, N-hydroxyethyl-ethylenediamine triacetic acid, diethylenetriamine pentaacetic acid, ni-

trilotriacetic acid, triethylenetetramine hexaacetic acid, ethanol glycine, diethanol glycine, iminodiacetic acid, glycoletherdiamine tetraacetic acid, 1,2-diaminopropane-N,N'-tetraacetic acid, 1,3-diaminopropan-2-ol-tetraacetic acid, N,N-dicarboxylmethylaminobarbituric acid, 1,2-diaminocyclohexane tetracarboxylic acid, tartaric acid, gluconic acid, citric acid, saccharic acid, polyacrylic acid or lignin sulfonic acid, or an alkali metal salt thereof.

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4,480,003

## CONSTRUCTION FOR TRANSPARENCY FILM FOR PLAIN PAPER COPIERS

Donald W. Edwards; Terrance J. Russell, and Donald J. Williams, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 20, 1982, Ser. No. 419,721
Int. Cl.³ B32B *3/02*; B05D *5/12*; G03G *7/00*
U.S. Cl. 428—329 18 Claims

1. In an optically transparent film which can be electrostatically imaged and which comprises

(a) a flexible, transparent, heat resistant polymeric film base,

(b) a toner-receptive layer carried on a first major surface of said film base, said toner-receptive layer having a surface resistivity equal to or exceeding about $1\times10^{14}$ ohms per square,

(c) an electrically conductive layer comprising an electrically conductive material carried on a second major surface of said film base, the improvement wherein said conductive material of said conductive layer does not migrate to objects which come in contact with said conductive layer, and said conductive layer further has a surface resistivity of from about $1\times10^{11}$ ohms per square to about $5\times10^{13}$ ohms per square.

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4,480,004

## MAGNETIC RECORDING MEDIUM

Fumio Togawa, Ohtsu; Takato Karashima, Nishinomiya, and Hiroshi Zaitsu, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Sep. 23, 1982, Ser. No. 422,302
Claims priority, application Japan, Sep. 24, 1981, 151468
Int. Cl.³ H01F *10/02*
U.S. Cl. 428—329 13 Claims

1. A magnetic recording medium which comprises a substrate and a magnetic layer thereon, said magnetic layer containing acicular magnetic metal particles having a particle size of not more than 0.3μ, a squareness ratio in the vertical direction of said layer of not less than 0.4, a squareness ratio in the lengthwise direction of said layer being not less than 0.57 and a coercive force (Hc) in the lengthwise direction of 800 to 2,000 oersteds.

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4,480,005

## THIN LAYER THERMOPLASTIC POLYMER BONDED COVALENTLY AT ITS SURFACE TO A MINERAL COMPONENT

Thomas F. Brownscombe, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 257,834, Apr. 27, 1981, Pat. No. 4,425,384. This application Sep. 6, 1983, Ser. No. 529,251
Int. Cl.³ B05D *7/00*; C08K *3/34, 3/00*; B32B *27/08*
U.S. Cl. 428—336 6 Claims

1. A polymer reinforcing material consisting of a particulate or filamentary mineral component having a thin polymer-interactive layer, averaging about 5–500 Angstrom in thickness, of silicon-free and heavy metal-free thermoplastic polymers chemically bonded to its surface by covalent bonding.

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4,480,006

## DISTANCE SHEETING FOR THE CONSTRUCTION OF MOLDS AND MODELS

Rudolf Rampf, Riederich, and Erich Sollner, Lehningen, both of Fed. Rep. of Germany, assignors to Ciba-Geigy GmbH, Baden, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,425
Int. Cl.³ C09U *7/02*
U.S. Cl. 428—343 6 Claims

1. Distance sheeting which is stable, not subject to mechanical influences, and has good adherence and separation properties with respect to positive mold forms for construction of molds and models characterized by the fact that it has been made by curing of 100 parts of weight of a material consisting of 45 to 60 parts by weight of an internally plasticized epoxy resin of low epoxide value within the range of from about 0.25 to about 0.35,

5–10 parts by weight of external plasticizer, and

35–45 parts by weight of a chalk globular-amorphous filler, and

9 to 13 parts of weight of a polyamine curing agent.

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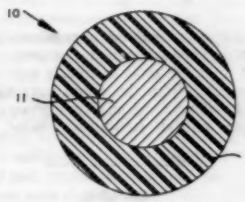
4,480,007

## ENAMEL HAVING IMPROVED COATABILITY AND INSULATED ELECTRICAL ARTICLES PRODUCED THEREFROM

Denis R. Pauze, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 183,857, Sep. 3, 1980, abandoned. This application May 21, 1982, Ser. No. 380,509
Int. Cl.³ B32B *15/08*; C08G *73/10*
U.S. Cl. 428—379 2 Claims




1. An insulated electrical article comprising a metallic conductor covered peripherally with a wall of cured, insulating polyetherimide resin wherein said wall contains a small amount of nylon polymer admixed with said resin sufficient to make the wall smooth.

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4,480,008

## SOLID POLYMER BINDERS FOR THERMOSETTING POWDER COATING COMPOSITIONS, POWDER COATING COMPOSITIONS CONTAINING THESE BINDERS AND METAL OBJECTS COATED WITH THESE COATING COMPOSITIONS

Silvestro Farronato, Romano d'Ezzelino, and Sergio Gazzea, Bassano del Grappa, both of Italy, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 337,389, Jan. 6, 1982, abandoned. This application Mar. 24, 1983, Ser. No. 478,450
Claims priority, application Italy, Jan. 8, 1981, 19042 A/81
Int. Cl.³ B32B *27/40*; B05D *3/02*
U.S. Cl. 428—425.8 15 Claims

4. An article coated with a thermosetting powder coating composition comprising a homogeneous mixture of

(I) a solid polymer binder comprising a combination of (A) a polyurethane prepolymer containing carboxyl groups, formed by the following reaction

$$X(M{-}H)+(OCN)_x{-}R^1{-}(NCO)_y+(HO)_y{-}R^2{-}(COOH)_n \rightarrow (MCONH)_x{-}R^1{-}(NHCOO)_y{-}R^2{-}(COOH)_n$$

wherein

M—H is a blocking agent different from oximes and containing one active hydrogen atom which is capable of reacting with an isocyanate,

$R^1$ and $R^2$ are aliphatic, cycloaliphatic or aromatic groups and x,y and n are equal or different integers being at least 1 and at most 15 and altogether at most 30 and containing from 1 to 40% by weight of blocked isocyanate groups and having an acid number in the range from 1 to 80, the residual amount of free isocyanate groups not exceeding 0.5% by weight of free NCO, with (B) at least one compound selected from the group consisting of homo- and hetero-functional compounds either containing hydroxy groups or being capable of producing hydroxy groups such that in the cross-linked products the content of COOH groups is not higher than 0.718% referred to the weight of component (A) and (B), with (II) at least one additive selected from the group consisting of dyes, pigments, fillers, flow agents thixotropic agents, additional cross linking agents, catalysts and oxidation inhibitors.

13. An article as claimed in claim 4, wherein the substrate is a metal.

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## 4,480,009
## SILOXANE-CONTAINING POLYMERS

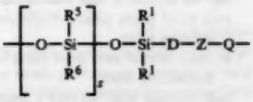
**Abe Berger, Summit, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.**

**Division of Ser. No. 216,599, Dec. 14, 1980, Pat. No. 4,395,527, which is a continuation-in-part of Ser. No. 158,056, Jun. 9, 1980, abandoned, Ser. No. 174,400, Aug. 1, 1980, abandoned, Ser. No. 126,666, Mar. 3, 1980, abandoned, Ser. No. 205,120, Nov. 10, 1980, abandoned, and Ser. No. 051,699, Jun. 25, 1979, abandoned, said Ser. No. 158,050, is a continuation-in-part of Ser. No. 958,358, Nov. 6, 1978, abandoned, said Ser. No. 174,400, is a continuation-in-part of Ser. No. 907,155, May 17, 1978, abandoned, said Ser. No. 126,666, is a continuation-in-part of Ser. No. 011,901, Feb. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 906,877, May 17, 1980, Pat. No. 4,139,547, said Ser. No. 205,120, is a continuation of Ser. No. 016,412, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 907,155, May 17, 1978, abandoned, said Ser. No. 051,699, is a continuation-in-part of Ser. No. 907,155, May 17, 1978, abandoned. This application Feb. 16, 1983, Ser. No. 466,986**

**Int. Cl.³ B32B 9/04**

**U.S. Cl. 428—447** **32 Claims**

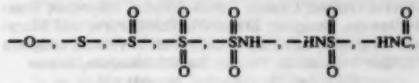
1. An article of manufacture comprising a substrate having disposed thereon a polymeric composition comprising a polyimide, poly(amide-imide) or a poly(half-amide) containing a thermally stable siloxane unit of formula

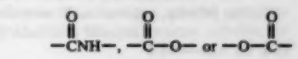


where

Q is a substituted or unsubstituted aromatic group

Z is





D is unsubstituted or substituted hydrocarbylene;

$R^1$, $R^2$, $R^3$, $R^4$, $R^5$ and $R^6$ each independently is unsubstituted or substituted hydrocarbyl;

x, y and z each independently has a value from 0 to 100.

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## 4,480,010
## METHOD AND COATING MATERIALS BY ION PLATING

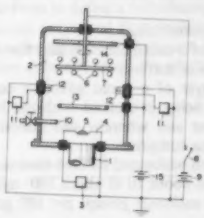
**Yasutomo Sasanuma, Kawagoe; Masao Koshi, Sayama; Teruaki Takahashi, Iruma; Shotaro Shimizu, Kunitachi; Mitsugu Enomoto, Higashikurume, and Youji Yoshikawa, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed May 25, 1983, Ser. No. 497,881**

**Claims priority, application Japan, Jun. 18, 1982, 57-105155**

**Int. Cl.³ B32B 15/04**

**U.S. Cl. 428—457** **11 Claims**



1. A method for coating materials by ion plating comprising the steps of:

providing an ion plating apparatus comprising:

a vapor source at ground potential;

a substrate holder located above said vapor source;

a pair of anodes located on the side of said vapor source with respect to said substrate holder and the opposite side of said substrate holder;

one or more thermoelectron emitting filaments located between said anodes;

a vacuum chamber for accomodating said elements, said vacuum chamber having a gas inlet and an evacuation system;

means for applying a negative potential relative to that of said vapor source to a substrate supported by said substrate holder; and

means for removing said negative potential to leave the potential of said substrate floating;

at an initial stage, ionizing a gas introduced from said gas inlet and a vapor of an evaporation material from said vapor source, and ion plating a surface of said substrate with a film of said evaporation material or a compound of said evaporation material and said introduced gas, said substrate being cathodically biased relative to said vapor source;

at an intermediate stage, while driving said ionizing means, continuing ion plating with the potential of said substrate left floating; and

at a final stage, while driving said ionizing means, continuing ion plating with the potential of said substrate again made negative relative to that of said vapor source.

11. A coated substrate made by the method of claim 1.

4,480,011

## ANTI-CORROSION AND ANTI-FOULING MARINE COATINGS

Jean-Pierre Durand, Chatou; Denise Nicolas, Maurepas; Francois Dawans, Bougival; Ernest Maréchal, Paris, and Maryvonne Brigodiot, Chatenay Malabry, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 23, 1982, Ser. No. 401,428
Claims priority, application France, Jul. 24, 1981, 81 14595
Int. Cl.³ B32B *27/06*
U.S. Cl. 428—474.4 16 Claims

1. A coating composition, useful for protecting immersed bodies, which comprises:

(a) at least one sub-layer, based on chlorinated natural rubber, in contact with the surface of the body to be coated;

(b) an external layer comprising at least one polyamide; and

(c) at least one intermediate layer consisting mainly of chlorinated natural rubber modified by grafting acrylic monomers thereon, or by attaching amino-acids, amino-esters, amino-amides, oligoamides or polyamides thereto.

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4,480,012

## CONTACT ADHESIVE AND ADHESIVE SYSTEM FOR EPDM AND RELATED ELASTOMERS

John W. Fieldhouse, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 431,403, Sep. 30, 1982, Pat. No. 4,450,252.
This application Mar. 12, 1984, Ser. No. 588,848
Int. Cl.³ B32B *25/16, 31/12*
U.S. Cl. 428—506 10 Claims

10. A laminate comprising:

(a) a first layer of a cured EPDM, said first layer having an upper and lower surface;

(b) a second layer of a cured adhesive composition, said second layer being in contact with the lower surface of said first layer and wherein said adhesive composition prior to curing comprises:

(i) a neutralized sulfonated EPDM elastomeric terpolymer having from about 10 to about 100 milliequivalents of neutralized sulfonate groups per 100 grams of terpolymer;

(ii) from about 500 to about 1700 parts by weight per 100 parts by weight of said terpolymer of an organic hydrocarbon solvent or mixture of an organic hydrocarbon solvent and an aliphatic alcohol;

(iii) from about 25 to about 100 parts by weight per 100 parts by weight of said terpolymer of a para-alkylated phenol formaldehyde or N-methylol morpholine-modified para-alkylated phenol formaldehyde tackifying resin; and

(iv) from about 12.5 to about 75 parts by weight per 100 parts by weight of said terpolymer of an alkylphenol or ethoxylated alkylphenol; and

(c) a third layer of a cured EPDM, said third layer having an upper and lower surface with said upper surface being in contact with said second layer of cured adhesive composition.

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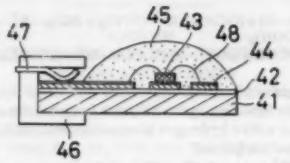
4,480,013

## SUBSTRATE FOR USE IN SEMICONDUCTOR APPARATUS

Yoshihiko Doi; Nobuo Ogasa; Akira Ohtsuka, and Tadashi Igarashi, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 14, 1982, Ser. No. 398,871
Claims priority, application Japan, Jul. 20, 1981, 56-113878
Int. Cl.³ C23C *17/00*
U.S. Cl. 428—616 9 Claims

1. A substrate for a semiconductor apparatus characterized in that the surface and lateral faces of a metal material or multi-laminated metal material are coated with at least one thin layer of insulative inorganic matter to a thickness of 0.1~20μ by means of a PVD method or CVD method, said metal material or multi-laminated metal material having a thermal expansion coefficient of $3 \sim 10.0 \times 10^{-6}$ cm/cm°C. and/or a thermal conductivity of above 0.2 cal/cm.sec.°C.

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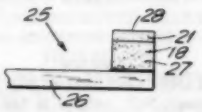
4,480,014

## ELECTRICAL CONTACT MEANS WITH GOLD-NICKEL ALLOY OVERLAY

Edward J. Milligan; Delbert A. Nauman, and Nathaniel R. Quick, all of Indianapolis, Ind., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,705
Int. Cl.³ H01H *1/00*
U.S. Cl. 428—672 2 Claims




1. An electrical contact structure comprising, base means providing a metallic electroconductive base surface and a current path for flow of electric current between such surface and another location, and an overlay on such base surface and having an inner surface bonded to such base surface and an outer surface providing an electrical contact surface, said overlay being constituted of a gold-nickel alloy in which the amount of nickel in said alloy is restricted to a range extending from about 1.8% to about 2.3% of the percentage by weight of said alloy, the balance of the percentage by weight of said alloy being constituted of gold with or without one or more other metals other than nickel in trace amounts insufficient to produce precipitation of such one or more metals out of solution in said gold, said nickel being present in said overlay in the form of a dispersion of fine grain nickel particles which are precipitated from solution out of the surrounding gold, and which impart graininess to said electrical contact surface, and any nickel agglomerates exposed at said surface being essentially limited in size to a mean diameter of at most about 1.6 microns.

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4,480,015

## BRAZING METHOD AND ALLOY FOR BISMUTH STEEL

Lynda M. Riekels, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Aug. 18, 1982, Ser. No. 409,158
Int. Cl.³ B23K *35/30*
U.S. Cl. 428—677 21 Claims

15. An article of manufacture comprising:

two steel parts joined together with copper brazing at a brazing joint;

at least one of said steel parts being composed of bismuth-containing steel;

said brazing joint having a lead content constituting about 0.05–1.0 wt.% of the brazing metal in the joint, the balance of said brazing metal consisting essentially of copper.

**4,480,016**

## HOMOGENEOUS, DUCTILE BRAZING FOILS

**Claude Henschel, Mt. Freedom, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Continuation of Ser. No. 177,048, Aug. 11, 1980, abandoned, which is a continuation of Ser. No. 25,529, Mar. 30, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 423,931**

**Int. Cl.³ B32B *15/04***

**U.S. Cl. 428—678** **4 Claims**

1. A brazed metal article, said article having metal parts, said metal parts having been brazed with a filler material in the form of a homogeneous, ductile brazing foil composed of metastable material having at least 50 percent glassy structure, said foil having a composition consisting of about 0 to 10 atom percent iron, about 2–5 atom percent molybdenum, about 10 to 30 atom percent cobalt, about 16 to 18 atom percent boron, 5 to 15 atom percent chromium the balance essentially nickel and incidental impurities, wherein the braze material has a capability of a joint tensile strength of 43,680 to 76,000 psi when brazed to grade 316 stainless steel.

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**4,480,017**

## FUEL CELL

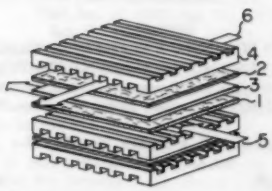
**Masato Takeuchi, Katsuta; Hideo Okada; Sigeru Okabe, both of Hitachi; Hiroshi Tobita, Katsibaraki, and Munehiko Tonami, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 26, 1983, Ser. No. 461,256**

**Claims priority, application Japan, Jan. 29, 1982, 57-14014**

**Int. Cl.³ H01M *8/14***

**U.S. Cl. 429—38** **18 Claims**




1. A molten carbonate fuel cell comprising

at least a pair of electrodes,

a porous body impregnated with an electrolyte composition of metal carbonates, said body sandwiched between said electrodes, and said body being made of one or more refractory, non-electron conductive, inorganic materials containing lithium titanate in an amount sufficient to stabilize said inorganic materials at a temperature of operation of said fuel cell, and

an oxidant passage means for supplying an oxidant to one of said electrodes and a fuel passage means for supplying a hydrogen enriched fuel gas to the other electrode.

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**4,480,018**

## SEALED FEED-THROUGH FOR A WALL IN AN ALKALINE BATTERY

**Laurent de Bellis, Le Bouscat, and Raymond Prokopp, Bordeaux, both of France, assignors to Societe Anonyme dite SAFT, Romainville, France**

**Filed Sep. 14, 1983, Ser. No. 532,063**

**Claims priority, application France, Sep. 23, 1982, 82 16017**

**Int. Cl.³ H01M *2/24***

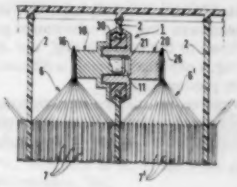
**U.S. Cl. 429—160** **5 Claims**

1. A sealed feed-through for interconnecting two cells of an alkaline storage battery by passing through a wall of said battery in a sealed manner, said battery including a monobloc casing of plastic material defining at least two battery cell compartments which are separated by said wall, said wall having an orifice for receiving said feed-through; said feed-through comprising:

a first portion for electrical connection to electrodes of a first polarity in a first of said two cells to be interconnected by means of the feed-through; and

a second portion for electrical connection to electrodes of a second, opposite, polarity in the second of said two cells to be interconnected by means of the feed-through;

the improvement wherein said first and second portions include interfitting male and female portions suitable for



passing through said orifice from opposite sides thereof and for engaging each other in a force fit;

wherein said first and second portions further include respective skirts surrounding said interfitting portions and serving to compress at least one deformable sealing member around said orifice; and

wherein said first and second portions include interacting abutment surfaces to define a fully-home position in which the portions are prevented from moving into closer relationship, thereby ensuring that the act of forcing the portions together does not crush the plastic wall.

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**4,480,019**

## ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

**Teruaki Higashiguchi, Tokyo; Kaname Nakatani, Kawasaki, and Nobuhiro Miyakawa, Abiko, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

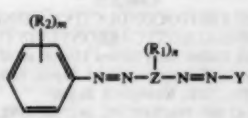
**Filed Apr. 12, 1983, Ser. No. 484,262**

**Claims priority, application Japan, Apr. 13, 1982, 57-60312**

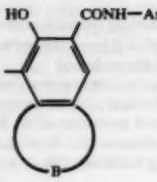
**Int. Cl.³ G03G *5/02, 5/05, 5/06***

**U.S. Cl. 430—58** **23 Claims**

1. A photosensitive material for electrophotography, which comprises a photosensitive layer containing a photoconductive disazo pigment represented by the following formula:

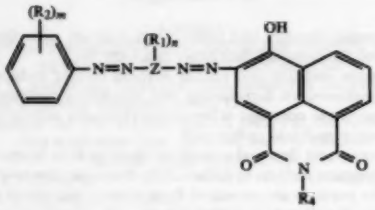



wherein $R_1$ stands for a lower alkyl group or a lower alkoxy group, n is a number of zero, 1 or 2, $R_2$ stands for a lower alkyl group, a lower alkoxy group, a di-lower-alkylamino group, a nitro group or a halogen atom, m is a number of zero, 1 or 2, Z stands for a benzene ring or a naphthalene ring, and Y stands for a group represented by the following formula:



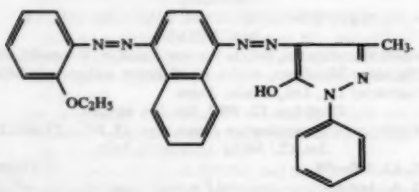
in which B stands for a benzene, naphthalene, indole, carbazole or banzofuran ring or a substitution product thereof, which is fused to the benzene ring, and $Ar_1$ stands for a benzene ring, a naphthalene ring, a dibenzofuran ring or a substitution product thereof.

9. A photosensitive material for electrophotography, which comprises a photosensitive layer containing a photoconductive disazo pigment represented by the following formula:



wherein $R_1$ stands for a lower alkyl group or a lower alkoxy group, n is a number of zero, 1 or 2, $R_2$ stands for a lower alkyl group, a lower alkoxy group, a di-lower-alkylamino group, a nitro group or a halogen atom, m is a number of zero, 1 or 2, Z stands for a benzene ring or a naphthalene ring, and $R_4$ stands for a hydrogen atom, a lower alkyl group, a phenyl group or a substituted phenyl group.

17. A photosensitive material for electrophotography, which comprises a photosensitive layer containing a photoconductive disazo pigment represented by the following formula:



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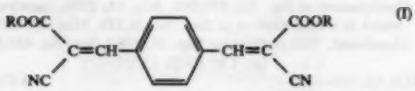
4,480,020

**POLYMERIC PHOTOCONDUCTIVE SENSITIZED BY BIS(β-CYANO-β-ALKOXYCARBONYLVINYL)BENZENE**

Syunichi Kondo; Hideo Sato; Satoru Honjo, all of Saitama, and Akira Umehara, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 339,794, Jan. 15, 1982, abandoned, which is a continuation of Ser. No. 160,895, Jun. 19, 1980, abandoned. This application Apr. 18, 1983, Ser. No. 486,272
Claims priority, application Japan, Jun. 19, 1979, 54-77153
Int. Cl.³ G03G 5/07, 5/09
U.S. Cl. 430—81 12 Claims

1. A photoconductive composition comprising photoconductive polymer and 1,4-bis(β-cyano-β-alkoxycarbonylvinyl)-benzene represented by the following general formula (I) whose content ranges from 0.02 mol to 0.5 mol per mol of the π-electron system-containing constitutional repeating unit contained in said photoconductive polymer:



(I)

wherein R represents a methyl group, an ethyl group, a propyl group, or an isopropyl group.

3. The photoconductive composition of claim 1, wherein the photoconductive polymer is a polymer of N-vinylcarbazole.

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4,480,021

**TONER COMPOSITIONS CONTAINING NEGATIVE CHARGE ENHANCING ADDITIVES**

Chin H. Lu, and Christopher J. AuClair, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 10, 1983, Ser. No. 474,011
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106.6 19 Claims

1. A negatively charged toner composition comprised of resin particles, and pigment particles, and from about 0.1 percent to about 20 percent by weight of an aryl sulfone negative charge exhancing additive of the formula $R_1—SO_2—R_2$ wherein $R_1$ is an alkyl group containing from about 6 carbon atoms to about 22 carbon atoms, or an aryl group, and $R_2$ is an aryl group containing from about 6 carbon atoms to about 18 carbon atoms.

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4,480,022

**METHOD FOR FORMING A SELF-FIXED IMAGE ON A NONPOROUS SURFACE AT AMBIENT TEMPERATURE**

Peter S. Alexandrovich, and Stewart H. Merrill, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,725
Int. Cl.³ G03G 13/20
U.S. Cl. 430—119 12 Claims

1. An electrographic method of forming a self-fixed toner image on a film surface comprising:

(a) forming a latent electrostatic image on said surface;

(b) developing said image with a liquid electrographic developer comprising:

(1) a volatile, electrically insulating liquid carrier and

(2) toner particles, dispersed in said carrier, comprising a polymer having a glass transition temperature within the range from about −10° C. to about 30° C., to form an unfixed toner image comprising said toner and said volatile carrier, and

(c) allowing said volatile carrier to evaporate from said toner image in the absence of externally applied heat other than that from ambient conditions, thereby fixing said toner to said film surface.

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4,480,023

**RADIANT ASSIST PRESSURE FIXING PROCESS WITH POLYAMIDE TONER COMPOSITIONS**

Bernard Grushkin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1983, Ser. No. 478,926
Int. Cl.³ G03G 13/22
U.S. Cl. 430—124 10 Claims

1. An improved process for fixing developed electrostatic images consisting essentially of (1) forming an electrostatic latent image on an imaging member, (2) developing the image with a toner composition comprised of polyamide toner resin particles, and pigment particles, (3) transferring the developed image to a substrate, and (4) sequentially subjecting the trans-

ferred image to a cold pressure fixing source, and a radiant energy fixing source.

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**4,480,024**

## INDUSTRIAL X-RAY PHOTOTHERMOGRAPHIC SYSTEM

**Thomas D. Lyons, St. Paul, Minn., and Gregory J. McCarney, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Oct. 21, 1983, Ser. No. 544,388**
**Int. Cl.³ G03C 5/16**
**U.S. Cl. 430—139** **7 Claims**

1. An industrial X-ray imaging system comprising
(a) a cassette
(b) at least one X-ray intensifying screen with rare-earth phosphor particles having an average diameter of less than 6 microns on an interior surface of said cassette
(c) a light sensitive material adjacent said intensifying screen,

wherein said light-sensitive material is characterized by being a photothermographic emulsion comprising a long-chain fatty carboxylic acid, a layer of silver salt of a long-chain fatty carboxylic acid, silver halide, an organic reducing agent for silver, and a binder on a visually homogeneous, white, translucent substrate, the silver salt being present in in a molar ratio of 1.5/1 to 6.2/1 with respect to said acid.

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**4,480,025**

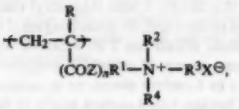
## WATER RESERVOIR LAYERS IN BLEACH-FIX SHEETS

**Hao J. Chang, Santa Clara, Calif.; Gerhard Popp, Webster, and Patrick H. Saturno, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

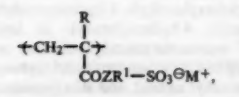
**Filed Jan. 13, 1983, Ser. No. 457,804**
**Int. Cl.³ G03C 5/54, 1/40, 5/38**
**U.S. Cl. 430—206** **24 Claims**

16. A process of producing a photographic image in a photographic film unit comprising an element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, said process comprising imagewise exposing said element to radiation, developing the image in a processing composition and treating the developed image with a bleach-fix sheet comprising a support having thereon at least one bleach-fix layer comprising:
(1) a metallic-silver bleaching agent,
(2) a silver salt fixing agent, and
(3) a hydrophilic binder

having thereover a water reservoir layer comprising a water-supplying polymer, said polymer comprising:
(1) from about 10 to about 70 percent by weight of recurring units having the formula selected from the group consisting of:



(I)



(II)

and a mixture of I and II, wherein:
R is hydrogen, methyl or halogen;
Z is oxy or imino;
n is 0 or 1;
$R^1$ is alkylene, cycloalkylene, arylene, arylenealkylene or arylenebisalkylene, the alkylene portions of which comprise from 1 to 6 carbon atoms;
$R^2$, $R^3$ and $R^4$ are independently hydrogen, alkyl or are taken together with N to form a nitrogen containing heterocyclic group;
$X^{\ominus}$ is an acid anion; and
$M^+$ is hydrogen, a metal ion or ammonium; and
(2) from about 30 to about 90 percent by weight of polymerized units of at least one other copolymerizable ethylenically unsaturated monomer,

said polymer having a water uptake of at least about 30 g water/g polymer when a weighed polymer sample coating is dipped in water for 10 seconds and thereafter reweighed, said bleach-fix sheet comprising in addition to said water reservoir layer a layer containing a mordant for dyes.

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**4,480,026**

## STABLE DISPERSIONS FOR USE IN PHOTOGRAPHIC FILM HAVING AN OPAQUE BACKING LAYER

**Robert W. Ashcraft, and Rusty E. Koenigkramer, both of Towanda, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 2, 1982, Ser. No. 404,375**
**Int. Cl.³ G03C 1/84**
**U.S. Cl. 430—510** **6 Claims**

1. A photographic element prepared by coating a support on one side with a photosensitive silver halide emulsion layer and on the other side with an opaque backing layer containing an opacifying agent, characterized in that the coating composition for the backing layer is prepared by this sequence: (1) polyvinyl pyrrolidone/vinyl acetate copolymer is two-roll milled with carbon black which has been prewetted with a liquid which will swell or tackify the copolymer to produce a solid dispersion; (2) the solid dispersion is added to and mixed with a polyvinyl alcohol solution, and (3) suitable plasticizers, surfactants and coating aids are then added.

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**4,480,027**

## PHOTOGRAPHIC RECORDING MATERIAL FOR THE PRODUCTION OF COLOR IMAGES TO BE VIEWED BY REFLECTED LIGHT

**Erwin Schön, Leverkusen; Karl-Wilhelm Schranz, Odenthal, and Erich Wolff, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 3, 1982, Ser. No. 438,937**
**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145289**
**Int. Cl.³ G03C 1/76**
**U.S. Cl. 430—523** **2 Claims**

1. Photographic recording material having a single support layer for the preparation of colour images to be viewed by reflected light, in which said photographic material consists essentially of a layer combination in the following order, a transparent support layer which has a smooth and glossy surface on both sides, a light-sensitive element of one or more light sensitive, silver halide emulsion layers each with spectrally associated, non-diffusible colour couplers, and a light-reflective opaque layer of binder, wherein the transparent support layer consists of a transparent cellulose triacetate foil having a layer thickness of at least 90 μm or of a transparent polyethylene terephthalate foil having a layer thickness of at least 70 μm and wherein said support layers have a surface gloss on both sides of from 60 to 100% measured at 45° in a Goniometer and using a black glass plate as standard, and a layer of binder containing a photographically- or chemically-active substance arranged on that side of the light reflective layer which is remote from the transparent support layer and wherein said substance of said binder layer is permeable into and through said opaque layer.

**4,480,028**

## SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Kazuo Kato; Yoshikazu Watanabe; Kenji Kumashiro, and Satoru Shimba, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

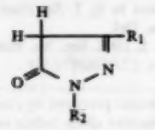
**Filed Jan. 28, 1983, Ser. No. 461,938**

**Claims priority, application Japan, Feb. 3, 1982, 57-16667**

**Int. Cl.³ G03C 7/26**

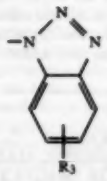
**U.S. Cl. 430—544** **10 Claims**

1. A silver halide color photographic light-sensitive material comprising a support and at least two coating layers thereon, at least one of said coating layers is a light sensitive silver halide emulsion layer, at least one of said coating layers is a non-light-sensitive hydrophilic colloidal layer, and at least one of said coating layers comprises at least one magenta coupler of Formula I and at least one development inhibitor releasing compound having a development inhibitor radical of Formulas II or III, said Formula I being



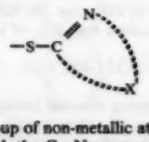
I

wherein $R_1$ is selected from benzamido, anilino, and phenylureido, each having a sulfonamido group and $R_2$ is selected from aryl and heterocyclic groups; said Formula II being



II

wherein $R_3$ is selected from hydrogen, halogen, acylamino, alkyl, benzothiazolinylidenamino and phenyl substituted alkoxy; said Formula III being



III

wherein X is a group of non-metallic atoms necessary to complete, together with the C=N group, a five or six membered heterocyclic ring.

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**4,480,029**

## BIOLOGICAL INDICATORS AND THEIR USE

**Gary H. Dolana, Mission Viejo, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Apr. 27, 1981, Ser. No. 258,064**

**Int. Cl.³ C12Q 1/70, 1/56; C12N 9/48, 7/04, 7/06**

**U.S. Cl. 435—5** **1 Claim**

1. A method for testing the efficacy of a viral inactivation method, which viral inactivation method consists essentially of heating a dry sample of AHF and/or at least one blood clotting enzyme suspected to contain such virus until the sample is substantially free of infectious virus and denatured blood clotting enzyme, comprising

(a) preparing a lyophilized biological indicator comprising a predetermined titer of infectious virus and AHF and/or at least one blood clotting enzyme, said AHF being present in a concentration of greater than about 35 International Units of AHF per gram of protein and said enzyme being purified about from 3 to 50 fold over its concentration in normal human plasma;

(b) exposing the indicator to said viral inactivation method; and

(c) assaying for any infectious virus remaining in the indicator.

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**4,480,030**

## TRIPEPTIDE DERIVATIVES AND THEIR APPLICATION IN ASSAYING ENZYMES

**Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland**

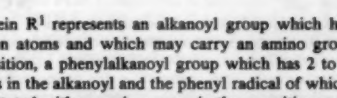
**Division of Ser. No. 302,420, Sep. 16, 1981, Pat. No. 4,440,678. This application Sep. 15, 1982, Ser. No. 418,257**

**Claims priority, application Switzerland, Feb. 12, 1980, 1130/80**

**Int. Cl.³ C12Q 1/36, 1/38, 1/56, 1/00**

**U.S. Cl. 435—13** **9 Claims**

1. A process for quantitatively assaying factor Xa in a medium which contains factor Xa or in which factor Xa is formed or consumed, comprising reacting said medium with a tripeptide derivative having the formula



I

wherein $R^1$ represents an alkanoyl group which has 2 to 8 carbon atoms and which may carry an amino group in the ω-position, a phenylalkanoyl group which has 2 to 4 carbon atoms in the alkanoyl and the phenyl radical of which may be substituted with an amino group in the p-position, a cyclohexylcarbonyl group which may be substituted with an aminomethyl radical in the 4-position, a benzoyl group which may be substituted with methyl, amino or halogen in the o- or p-position, an alkoxycarbonyl group having 1 to 8 carbon atoms in the alkoxy group, a benzyloxycarbonyl group which may be substituted with methoxy, methyl or chlorine in the p-position, an alkanesulfonyl group having 1 to 4 carbon atoms, a phenylsulfonyl group which may be methylated in the p-position or an α- or β-naphthylsulfonyl group, $R^2$ represents a straight-chained or branched alkyl radical having 1 to 6 carbon atoms, a hydroxyalkyl radical having 1 to 2 carbon atoms, an alkoxyalkyl radical having 1 to 2 carbon atoms in the alkyl and 1 to 4 carbon atoms in the alkoxy, a benzyloxyalkyl radical having 1 to 2 carbon atoms in the alkyl, an ω-carboxyalkyl or ω-alkoxycarbonylalkyl radical which has 1 to 3 carbon atoms in the alkyl and the alkoxy group of which is straight-chained or branched and has 1 to 4 carbon atoms, or an ω-benzyloxycarbonylalkyl radical having 1 to 3 carbon atoms in the alkyl, or a cyclohexyl-, cyclohexylmethyl-, 4-hydroxycyclohexylmethyl-, phenyl-, benzyl-, 4-hydroxybenzyl- or imidazol-4-ylmethyl radical, $R^3$ represents a straight-chained or branched alkyl radical having 1 to 4 carbon atoms, $R^4$ represents hydrogen or a methyl or ethyl radical, and $R^5$ represents an amino group which is substituted with aromatic or heterocyclic radicals and which is capable of being split off hydrolytically with formation of a colored or fluorescent compound H—$R^5$, and salts thereof with acids and measuring, by photometric, spectrophotometric, fluorescence-spectrophotometric or electrochemical methods, the quantity of the colored or fluorescent split product H—$R^5$ released per time unit by the catalytic hydrolytic acid of factor Xa on the tripeptide derivative.

4,480,031

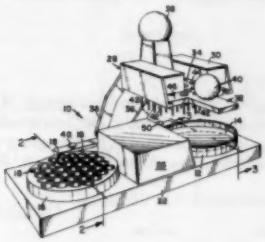
## REPLICATOR WITH SLIDABLE PINS

Joseph R. H. Shaw, 231 Arundel Ave., St. Paul, Minn. 55102

Continuation of Ser. No. 317,177, Nov. 2, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,258

Int. Cl.³ C12Q *1/00*; C12M *1/20, 1/26*

U.S. Cl. 435—30 10 Claims



1. In combination with a replicator device having a transport arm carrying a support movable between a first position immediately above a tray having a plurality of liquid containable wells patterned therein, and a second position immediately above a test medium plate spaced laterally from the tray; a transfer head seatable on the support, the head comprising:

(a) a platen having a plurality of apertures formed therethrough, said apertures formed in a pattern sized and shaped similarly to the pattern formed by the wells in the tray; and

(b) a plurality of pins, each of said pins extending through one of said apertures and sized relative thereto to permit free movement relative to said platen.

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4,480,032

## NATURAL MIXTURE OF TYPE I AND TYPE II INTERFERONS

Alexander A. Yabrov, 45 Wiggins St., Princeton, N.J. 08540

Filed Nov. 13, 1980, Ser. No. 206,401

Int. Cl.³ C12P *21/00*; A61K *45/02*; C07G *7/00*

U.S. Cl. 435—68 3 Claims

1. A method of producing in vitro a natural mixture of Type I and Type II interferons which comprises adding measles vaccine virus to a physiological medium containing normal immune leukocyte cells obtained from human donors immune to measles; incubating the resulting admixture for a period of time sufficient to induce a natural mixture of Type I and Type II interferons in the cells contained in said medium; and recovering a suspension containing said natural mixture of Type I and Type II interferons.

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4,480,033

## LANKACIDINS PRODUCTION

Takashi Suzuki, Takatsuki; Junya Okada, Hirakata, and Hidekazu Sawada, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 6, 1983, Ser. No. 482,552

Claims priority, application Japan, Apr. 12, 1982, 57-61342

Int. Cl.³ C12P *17/08, 13/02*; C12R *1/465*

U.S. Cl. 435—124 6 Claims

1. A method for improving production of lankacidin antibiotics by culturing a microorganism capable of producing lankacidin, wherein cyclodextrin is added in a culture medium.

4,480,034

## CONTINUOUS FERMENTATION PROCESS AND BIOCONVERSION-PRODUCT RECOVERY

Jih-Han Hsieh, Parsippany, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,084

Int. Cl.³ C12P *7/44*; C12N *1/28*; C12M *1/36, 1/12*

U.S. Cl. 435—136 13 Claims

1. In a microbial bioconversion process in which a non-growth aromatic hydrocarbon substrate in an aqueous fermentation zone is bio-oxidized by intracellular enzyme activity of whole cells to an extracellular water-soluble carboxylic acid product having a molecular weight less than about 1000, and recovering said carboxylic acid product the improvement which comprises (1) continuously feeding an aqueous nutrient-limited stream into the fermentation zone; (2) continuously withdrawing whole cell-containing fermentation broth from the fermentation zone; (3) continuously passing the withdrawn fermentation broth through a cross-flow membrane filtration zone; (4) recovering a whole cell-containing retentate stream from the filtration zone, and recycling the retentate stream to the fermentation zone; and (5) recovering a cell-free product-containing permeate stream from the filtration zone, separating the product from the permeate stream, and recycling the resultant permeate stream to the fermentation zone.

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4,480,035

## PRODUCTION OF HYDROGEN

Sukomal Roychowdhury, 174 Heathecote Rd., Elmont, N.Y. 11003

Continuation-in-part of Ser. No. 157,860, Jun. 9, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 327,165

Int. Cl.³ C12P *3/00*

U.S. Cl. 435—168 1 Claim

1. A continuous process for the production of hydrogen from a cellulose material by microbial fermentation comprising the steps of:

(a) enzymatically hydrolyzing said cellulose material to produce a glucose solution

(b) maintaining said glucose solution and a nutritive support medium comprising a minimal salt solution and thioglycolate in a fermentation vessel at a pH of about 7 and at a temperature in the range of 30° to 60° C., said glucose being 1.5 to 20% by weight of the solution, and said solution being thereby amenable to decomposition by microbial metabolic action;

(c) inoculating said glucose solution with a hydrogen producing bacteria selected from the group consisting of: *Citrobacter freundii, Enterobacter aerogenes, Escherichia coli,* bacillus and pseudomona,

(d) permitting said inoculated glucose solution to incubate and produce hydrogen and carbon dioxide; and

(e) separating the hydrogen and carbon dioxide from said solution whereby hydrogen is produced in a substantial yield.

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4,480,036

## PROTEOLYTIC ENZYME

Hugh W. Morgan; Roy M. Daniel; Donald A. Cowan, and Christopher W. Hickey, all of Hamilton, New Zealand, assignors to Development Finance Corporation, Wellington, New Zealand

Filed Aug. 8, 1980, Ser. No. 176,527

Claims priority, application New Zealand, Aug. 8, 1979, 191246

Int. Cl.³ C12N *9/52, 1/20*

U.S. Cl. 435—220 16 Claims

1. A proteolytic enzyme derived from the microorganism *Thermus aquaticus* (Variety T-351), ATCC No. 31,674, having an isoelectric point of about pH 8.5, a molecular weight of 20,000±3,000, stability at temperatures up to 75° C. at pH values from 4 to 12 in the presence of divalent cations, and being destabilized by EDTA.

4,480,037

## ALKALINE PROTEASE AND PREPARATION METHOD THEREOF

Fiji Ichishima, Fuchu, and Takashi Onouchi, Tokyo, both of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 465,064
Claims priority, application Japan, Feb. 8, 1982, 57-17596
Int. Cl.[3] C12N *9/54, 9/56;* C12R *1/07*
U.S. Cl. 435—221 2 Claims

1. Alkaline protease API-21 having the following physicochemical properties:

(1) Activity: Hydrolyzes casein under alkaline conditions, with an optimum pH range of 10 to 11, and has optimum temperature range for activity of 45° C. to 50° C.;

(2) Stability: No decrease in enzymatic activity observed up to 40° C. upon heating without temperature substrate for 10 minutes at a pH of 10, but a 90% or more decrease of enzymatic activity observed at 50° C. for 10 minutes at a pH of 10. Deactivation occurs at 50° C. upon heating for 10 minutes at a pH of 8 and complete deactivation substantially occurs at 60° C. for 10 minutes at a pH of 8. The protease is stable under alkaline conditions, especially within a pH range of 7 to 11.5, and is stable against freezing and freeze-drying; and

(3) Enzyme molecule: The protease is protein having a molecular weight of about 22000 as estimated by a gel filtration method, an isoelectric point of 7.4 as estimated by an electrofocusing method, an absorption peak of 275 to 282 nm in a UV absorption spectrum, IR absorption characteristics as shown in FIG. 5, and a serine residue in the active site thereof.

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4,480,038

## DENSITY SEPARATION OF PROTEIN OVERPRODUCING BACTERIA

Yih-Shyun E. Cheng, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1982, Ser. No. 373,702
Int. Cl.[3] C12N *1/00, 1/20, 1/02, 15/00;* C12Q *1/29, 1/04;* C12P *21/00, 21/02*
U.S. Cl. 435—261 5 Claims

1. A method for separating protein overproducing *E. coli* bacteria from admixture with normal *E. coli* bacteria that do not overproduce protein the separation method being applied after bacterial growth stops, comprising fractionating the admixture, based on density difference between said bacteria, into (i) a fraction richer in protein overproducing bacteria than in normal bacteria and (ii) a fraction richer in normal bacteria than in protein overproducing bacteria, fraction (i) being at least about 0.02 g/ml more dense than fraction (ii) after growth stops.

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4,480,039

## HEAVY OIL SAMPLE PREPARATION

Philip J. Closmann, Houston, and James T. Wortham, Edna, both of Tex., assignors to Shell Oil Company, Houston, Tex.

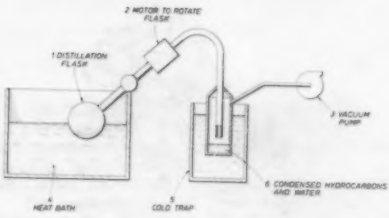
Filed Dec. 10, 1982, Ser. No. 448,542
Int. Cl.[3] G01N *1/00, 33/28;* C10M *11/00*
U.S. Cl. 436—175 3 Claims

1. A process for preparing for laboratory utilizations a substantially solids-free sample of a heavy reservoir oil in which the hydrocarbon distribution is substantially the same as that in the reservoir oil, comprising:

vacuum-distilling volatile components from a field sample of oil or oil-containing material from a subterranean heavy oil reservoir at a temperature which is at least significantly greater than the boiling point of an oil solvent to be used for subsequently dissolving the heavy hydrocarbon components of the reservoir oil but is less than the boiling or cracking temperature of the heavy hydrocarbon components of the reservoir oil while condensing and retaining substantially all of the distillate;

mechanically separating water from hydrocarbon components of the resultant condensate;

dissolving the remaining topped heavy hydrocarbon components of the reservoir oil in a volatile oil solvent and mechanically freeing the solution of substantially all solid particles having diameters greater than about 0.1 micron;




distilling substantially all of the volatile oil solvent from the solids-free solution at a temperature and pressure which is significantly less than that used in the vacuum distillation of the field sample; and

combining the condensed volatile hydrocarbon components with the heavy hydrocarbon components from which solids have been removed to provide a substantially solids-free sample of oil having a hydrocarbon distribution substantially equalling that of the reservoir oil.

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4,480,040

## SENSITIVE AND RAPID DIAGNOSIS OF VIROID DISEASES AND VIRUSES

Robert A. Owens, and Theodor O. Diener, both of Beltsville, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 3, 1981, Ser. No. 327,296
Int. Cl.[3] G01N *33/50;* C12N *15/00*
U.S. Cl. 436—504 6 Claims

2. A method for diagnosing potato spindle tuber viroid disease in potato tubers comprising:

(a) obtaining sap from the potato tuber being diagnosed;

(b) binding the sap obtained in step (a) to a solid support;

(c) probing the material bound to the solid support in step (b) with a previously prepared and radioactively labeled DNA that is complementary to PSTV nucleic acid the effect of said probing being the hybridization of any unpurified PSTV-RNA present in the bound material; and

(d) subjecting the probed material to autoradiographic examination to detect the presence of any DNA-RNA hybrids.

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4,480,041

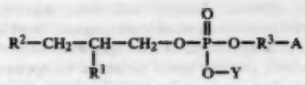
## USE OF PHOSPHOTRIESTER INTERMEDIATES FOR PREPARATION OF FUNCTIONALIZED LIPOSOMES

Arthur Myles, Stow; Say-Jong Law, Dedham, and Frank X. Cole, Stow, all of Mass., assignors to Collaborative Research, Inc., Lexington, Mass.

Filed Jul. 9, 1982, Ser. No. 396,678
Int. Cl.[3] G01N *33/54, 33/78*
U.S. Cl. 436—508 11 Claims

1. A method of forming an analyte-functionalized liposome for use in immunoassays comprising the steps of:

a. obtaining an intermediate having the structure

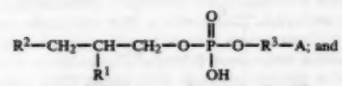


where $R^1$ and $R^2$ are independently selected from the group consisting of H, OH, R", OR" and

(where R" is selected from the group consisting of saturated, unsaturated, branched and straight-chain alkyl and alkylene groups of 1 to 24 carbons), wherein at least one of $R^1$ and $R^2$ is selected from the group consisting of

and OR"; and where $R^3$ is a side chain with a functional group capable of bonding to the analyte desired to be attached, A is an analyte, and Y is a triester-blocking group;

b. reacting said intermediate to form an amphiphilic compound having the structure



c. forming a liposome from the product of step (b) which is functionalized on its surface with said analyte and has a marker carried within said liposome.

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**4,480,042**

## COVALENTLY BONDED HIGH REFRACTIVE INDEX PARTICLE REAGENTS AND THEIR USE IN LIGHT SCATTERING IMMUNOASSAYS

**Alan R. Craig; William A. Frey; Charles C. Leflar; Catharine E. Looney, all of Wilmington, Del., and Michael A. G. Luddy, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 315,922, Oct. 28, 1981, Pat. No. 4,401,765, which is a continuation-in-part of Ser. No. 298,473, Sep. 1, 1981, abandoned. This application May 18, 1983, Ser. No. 495,621**

**The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.**

**Int. Cl.³ G01N *33/54***

**U.S. Cl. 436—533** **3 Claims**

1. A method for measuring compounds of biological interest comprising the steps of

(A) incubating

(1) a particle reagent having high refractive index consisting essentially of:

(a) a polymer particle having an inner core and an outer shell wherein the inner core is a polymer having a refractive index of not less than 1.54 as measured at the wavelength of the sodium D line and wherein the outer shell is a polymer of

(i) an ethylenically unsaturated monomer having a functional group capable of reacting with a compound of biological interest selected from the group consisting of epoxy, carboxyl, amino, hydroxyl and aldehyde,

(ii) optionally, other ethylenically unsaturated monomers in an amount sufficient to produce water insoluble polymer particles, and

(iii) not more than 10 parts by weight of the outer shell of the monomers of the inner core, said outer shell being formed by polymerization in the presence of said inner core and wherein said polymer particles has approximate diameter range of 0.03–0.1 μm;

and is covalently attached to

(b) an analog of a compound of biological interest;

(2) a liquid suspected of containing the compound of biological interest; and

(3) an agglutinating agent; and

(B) photometrically measuring increased particle size resulting from agglutination.

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**4,480,043**

## PROCESS FOR THE PREPARATION OF TOXOPLASMAS FOR THE DIAGNOSIS OF TOXOPLASMOSIS, AND PREPARATIONS THUS OBTAINED

**Gérard Trouyez, Charbonnieres les Bains, France, assignor to Biomerieux, Charbonnieres les Bains, France**

**Filed May 12, 1981, Ser. No. 262,893**

**Claims priority, application France, May 20, 1980, 80 11261**

**Int. Cl.³ A61K *39/00, 45/02*; G01N *33/54, 31/00***

**U.S. Cl. 436—536** **9 Claims**

1. A process for manufacturing a preparation of antigens of toxoplasmas whereby mixtures of toxoplasmas and cells of sarcoma TG 180 are inoculated in mice by the intraperitoneal route to produce toxoplasmas in the ascitic liquid, and the toxoplasmas are collected in the ascitic liquid obtained, wherein the process is improved by carrying out the operation in two steps: in the first step inoculating into mice a mixture of ascitic liquid containing toxoplasmas and ascitic liquid containing the sarcomatous cells and collecting the peritoneal exudate in from 48 to 72 hours after the inoculation, and in the second step inoculating into the mice a mixture of non-infected sarcomatous cells and sarcomatous cells infected by toxoplasmas obtained by centrifuging the exudate of the first step, collecting the peritoneal exudate from 48 to 72 hours after inoculation, and thereafter reacting the collected exudate with trypsin to free toxoplasmas from the cells.

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**4,480,044**

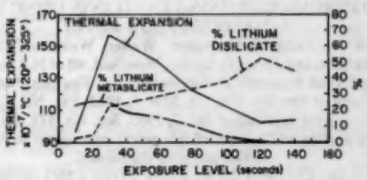
## HIGH EXPANSION GLASS-CERAMIC ARTICLES

**Patrick McAlinn, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Feb. 1, 1984, Ser. No. 575,902**

**Int. Cl.³ C03C *3/22***

**U.S. Cl. 501—4** **2 Claims**




1. A chemically-machinable glass-ceramic exhibiting a coefficient of thermal expansion over the interval of 20°–400° C. of about 120–160×$10^{-7}$/°C. consisting predominantly of lithium metasilicate, lithium disilicate, and quartz and/or cristobalite crystals dispersed in a residual glassy matrix, said glass-ceramic having a composition consisting essentially, expressed in terms of weight percent on the oxide basis, of 5.5–15% $Li_2O$, 2–25% $Al_2O_3$, the weight ratio $Al_2O_3$:$Li_2O$ being less than 1.7:1, 60–85% $SiO_2$, and at least one photosensitive metal in the indicated proportion selected from the group of 0.001–0.03%

gold, computed as Au, 0.001–0.3% silver, computed as AgCl, and 0.001–1% copper, computed as $Cu_2O$, the sum of those components constituting at least 90% by weight of the total composition.

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**4,480,045**

## ALUMINA-BASED CERAMIC COMPOSITION AND SUBSTRATE OBTAINED BY MEANS OF THIS COMPOSITION

**Yves Gougouyan, and Philippe Basseville, both of Bagnolet, France, assignors to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France**

**Continuation of Ser. No. 452,125, Dec. 22, 1982, abandoned. This application Mar. 14, 1984, Ser. No. 587,855**
**Claims priority, application France, Jan. 12, 1982, 82 00373**
**Int. Cl.³ C04B *35/10***
**U.S. Cl. 501—153** **3 Claims**

1. A process for producing a ceramic substrate for electronic components provided with holes, said substrate having a roughness of less than 10 microinch, comprising the steps of:
(1) Mixing in an aqueous medium to form a composition of from about 97 to 98.5 percent by weight of a mixture of:
(a) from about 65 to 95 percent by weight of a first alumina material having a grain size of from about 0.4 to 0.8 micron and a density of from about 2 to 2.20 which has been fired at a temperature of from about 1450° C. to 1580° C. to produce an alumina material having a density after firing of from about 3.85 to 3.96; and
(b) From about 34 to 5 percent by weight of a second alumina material having a grain size of from about 1.2 to 1.6 microns and a density of from about 2.2 to 2.3 which has been fired at a temperature of from about 1580° C. to 1650° C. to produce an alumina material having a density of from about 3.85 to 3.96; and
(c) From about 1.5 to 3 percent by weight of organic compounds comprising a deflocculating agent and an organic binder selected from the group consisting of butyl polyacrylates and copolymers thereof;
(2) Atomizing said composition;
(3) Screening the resulting composition to produce a granulated material having a grain size of from about 80 to 250 microns;
(4) Mechanically compressing said composition in a mold to produce an unfired substrate having holes to conform to the desired configuration of said substrate;
(5) Firing said substrate at a temperature of about 1580° C.; and
(6) Auto-polishing a plurality of said so fired substrates in the presence of water.

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**4,480,046**

## REACTIVATION PROCESS FOR IRIDIUM-CONTAINING CATALYSTS USING LOW HALOGEN FLOW RATES

**Shun C. Fung, Bridgewater; Walter Weisman, Berkeley Heights, and James L. Carter, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 374,976, May 5, 1982, Pat. No. 4,444,895. This application Jul. 7, 1983, Ser. No. 511,730**
**The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.**
**Int. Cl.³ B01J *23/96, 23/64, 23/46*; C10G *35/085***
**U.S. Cl. 502—35** **18 Claims**

1. A process for reactivating an agglomerated catalyst containing metallic iridium comprising the steps of:
(a) pretreating said catalyst by contact with a substantially elemental oxygen-free atmosphere comprising a halide-providing compound at elevated temperature for a sufficient time to provide about 1.3 weight percent and above halide to the catalyst, taken as the coke-free, dry catalyst; and
(b) redispersing the metallic iridium from step (a) while maintaining said 1.3 weight percent and above halide provided to the catalyst by contact with an atmosphere comprising elemental halogen and water wherein said water is present in a volume percent range of about 0.05 to 2, at elevated temperature, at a halogen mass flow rate of about one-tenth gram or less of elemental halogen per 100 grams of catalyst per hour for a total halogen amount of up to 0.5 gram halogen per 100 grams catalyst, for a time sufficient to effect about 75 to 100 percent redispersion of said metallic iridium.

2. The process of claim 1 wherein said catalyst is initially present substantially as agglomerated metallic iridium.

3. The process of claim 1 wherein said agglomerated iridium-containing catalyst is present on a catalyst support selected from silica, zeolite, alumina, silica-alumina, zirconia, alumina-zirconia, and mixtures thereof.

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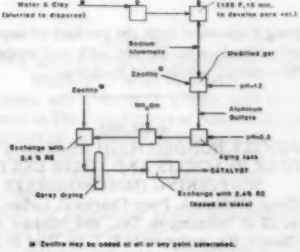
**4,480,047**

## HIGH PERFORMANCE CATALYSTS FOR CARBOMETALLIC OIL CONVERSION AND THEIR MANUFACTURING AND USE

**H. Wayne Beck, Russell, Ky.; James D. Carruthers, Fairfield, Conn.; Edward B. Cornelius, Ashland, Ky.; Ronald A. Kmecak, Ashland, Ky.; Stephen M. Kovach, Ashland, Ky., and William P. Hettinger, Jr., Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.**

**Filed Apr. 7, 1983, Ser. No. 483,061**
**Int. Cl.³ B01J *29/08***
**U.S. Cl. 502—65** **31 Claims**




1. A low coke, high octane, high activity, high selectivity, metal tolerant, thermally stable, low slurry oil producing catalyst for the conversion of hydrocarbons contaminated with high Conradson carbon metals to produce lower molecular weight products, said catalyst comprising in combination:
(a) from about 8 to about 25% by weight of a zeolite comprising a zeolite selected from the group consisting of a HY zeolite and an ultrastable HY zeolite having a silica-alumina mole ratio of at least about 5, and having a cell dimension of about 24.30 to about 24.70 angstroms;
(b) from about 20 to about 70 wt. % of a clay comprising kaolin, having a crystalline size of from about 0.5 to about 2 microns;
(c) from about 35 to about 70% of an acidic silica-alumina co-gel matrix comprising at least about 13 wt. % alumina;
(d) from about 0.1 to about 3 wt. % of rare earths comprising lanthanum and cerium in a ratio of from about 1 to about 6;
(e) from about 15 to about 60 wt. % alumina;
(f) wherein said zeolite is partially exchanged with said rare earths from a solution and wherein said zeolite is contained in said acidic matrix and wherein rare earthes have been precipitated onto said matrix;

4,480,048

## CATALYSTS FOR HYDROCARBONS CONVERSION

Jean-Paul Bournonville, Chatou, and Jean Miquel, Paris, both of France, assignors to Societe Francaise des Produits Pour Catalyse Pro-Catalyse chez Institute Francais Du Petrole, Reil-Maloison, France

Filed May 24, 1983, Ser. No. 497,632
Claims priority, application France, May 24, 1982, 82 09098
Int. Cl.³ B01J *27/10*; C10G *35/085*
U.S. Cl. 502—227 11 Claims

1. A catalyst comprising a carrier and, expressed by weight with respect to the carrier, from 0.05 to 0.6% of a noble metal of the platinum family, 0.005 to 5% of titanium, 0.005 to 3% of at least one metal selected from manganese, technetium and rhenium, and from 0.1 to 15% of halogen.

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4,480,049

## NIOBIUM (V) HALIDE/OXIDE-METAL OXIDE COMPOSITIONS AND A PROCESS FOR THEIR PREPARATION

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1983, Ser. No. 527,536
Int. Cl.³ B01J *21/04, 23/20, 27/10, 27/12*
U.S. Cl. 502—231 8 Claims

1. A process for preparing a metal oxide substrate having a niobium (V) halide(s) bound to the surface thereof which process comprises subliming niobium pentahalide and reacting in a substantially anhydrous and oxygen-free atmosphere the vapor therefrom with a substantially anhydrous metal oxide substate having surface hydroxyl groups attached thereto.

6. A composition comprising pentavalent niobium, halogen, oxygen and a metal oxide substrate wherein at least one valence of niobium is bound to oxygen which is bound to the substrate, at least one valence of the niobium is bound to halogen and the remaining niobium valences are bound to halogen and/or oxygen which may or may not be bound to the substrate wherein said halide is a mixture of chloride and fluoride and is prepared by a process which comprises:

(a) reacting a substantially anhydrous, hydroxyl-containing metal oxide substrate with niobium pentachloride in the vapor state,

(b) contacting the product of step (a) with an oxygen-containing atmosphere and

(c) contacting the product of step (b) with a liquid or gaseous fluorinated hydrocarbon.

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4,480,050

## EXHAUST GAS OXIDATION CATALYST

John F. Brennan, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 404,160, Aug. 2, 1982, abandoned. This application Nov. 25, 1983, Ser. No. 555,227
Int. Cl.³ B01J *21/04, 23/58*
U.S. Cl. 502—330 8 Claims

5. A catalytic composite prepared by the method including the step of impregnating a refractory inorganic oxide porous carrier material with a catalytically active metallic component selected from the group consisting of platinum, palladium and rhodium whereby said component is dispersed on the peripheral surface of said carrier material the improvement which comprises, prior to said impregnation of said catalytically active metallic component

(a) impregnating said refractory inorganic oxide porous carrier material with an aqueous solution of a lithium salt of an organic acid such that said carrier material contains from 0.1 to 0.8 wt. % Li on an elemental basis,

(b) drying said carrier material, and

(c) calcining said carrier material.

4,480,051

## ACTIVATED IRON HYDROGENATION CATALYST

James C. Wu, Beaumont, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1983, Ser. No. 519,991
Int. Cl.³ B01J *23/74*
U.S. Cl. 502—338 4 Claims

1. A process for the preparation of a hydrogenation catalyst which comprises (a) contacting an iron containing compound with a reducing gas comprising hydrogen at a temperature not exceeding about 600° C. until the iron is sufficiently reduced to produce an active hydrogenation catalyst (b) contacting the thus activated catalyst with a gas having an oxygen content of at least 10.5% to permit a pyrophoric reaction of the iron to occur and thereafter repeating step (a).

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4,480,052

## HEAT-SENSITIVE RECORDING MATERIALS

Seiji Ichijima; Nobutaka Ohki; Masato Satomura, and Ken Iwakura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

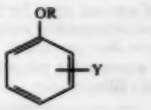
Filed Sep. 29, 1982, Ser. No. 427,036
Claims priority, application Japan, Oct. 2, 1981, 56-157795
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—208 15 Claims

1. A heat-sensitive recording material, comprising: a support and a composition thereon comprising:

an electron donating colorless dye in an amount of 0.1 to 2.0 $g/m^2$;

an electron accepting compound in an amount of 0.1 to 4.0 $g/m^2$; and

a phenol derivative in an amount of 0.1 to 4.0 $g/m^2$ and represented by the general formula (I):




(I)

wherein R is an alkyl group or an aralkyl group, and Y is a phenyl group, an alkyl group, a cycloalkyl group or a halogen atom.

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4,480,053

## COATING COMPOSITION AND METHOD

Stanley A. Sherno, Columbia, S.C., assignor to Aperm of South Carolina, Greenwood, S.C.

Continuation of Ser. No. 129,249, Mar. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,438, Dec. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 41,592, May 23, 1979, abandoned. This application May 26, 1982, Ser. No. 382,217
Int. Cl.³ C08V *9/22*
U.S. Cl. 521—54 11 Claims

1. An aqueous coating composition for providing a tenaciously adherent, resinous, lightweight, heat insulating and weather resistant coating on a roof or other exterior surface of a building, said composition comprising an aqueous thermoplastic synthetic resin latex prepared by emulsion polymerization and capable of forming a film, and dispersed therewith, a plurality of discrete multicellular particles of foamed polystyrene, said particles having a particle size of 0.03 to 0.3 inch and a thickening agent selected from the group consisting of starch, gel, gum and hydroxyethylcellulose, the resin latex being present in an amount of 2–60 parts by volume of resin solids per 100 parts by volume of polystyrene particles, and said thickening agent being present in an amount sufficient to increase the viscosity of the aqueous coating composition to a paint-like consistency and provide a coating composition capable of

providing a coating having a thickness of about 30 mils to one inch.

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**4,480,054**

## FOAMABLE POLYMER BLEND COMPOSITIONS

**Susan J. Enderle, Wilmington, Del., assignor to E. I Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 514,228, Jul. 15, 1983,. This application Jan. 23, 1984, Ser. No. 573,025**

**Int. Cl.³ C08J** *9/10*

**U.S. Cl. 521—84.1** **18 Claims**

1. A compatible foamable, readily formable, curable polymer blend consisting essentially of the following components present in the following approximate weight amounts:

(1) 50–100 parts of a dipolymer E/A or terpolymer E/A/B, wherein E is ethylene; A is acrylic or methacrylic acid; and B is n-butyl or isobutyl acrylate; the weight proportion of monomer A in both the dipolymer and the terpolymer being about 2–20% and the weight proportion of monomer B in the terpolymer being at most about 23%; the carboxylic acid groups in either type of polymer being either unneutralized or neutralized to an extent of at most about 71% with metal ions having a valency of from 1 to 3;

(2) 2–40 parts of a terpolymer E/X/Y, where E is ethylene; X is vinyl acetate or a $C_1$–$C_8$ alkyl acrylate; and Y is CO or $SO_2$; the weight proportions of X and Y being as follows:

Y about 1–15%;

X, when it is vinyl acetate, about 15–30%, and when it is an alkyl acrylate, about 10–55%;

(3) 2–40 parts of an elastomer;

(4) 1–10 parts of a blowing agent;

(5) 0–10 parts of an activator for the blowing agent;

(6) 0.5–10 parts of a curing agent for the E/X/Y terpolymer selected from peroxides, sulfur and sulfur-releasing agents, and diamines and their precursors;

(7) 0–15 parts of a processing aid; and

(8) 0–100 parts of a filler.

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**4,480,055**

## PROCESS FOR MANUFACTURING MODIFIED AMINO-RESIN PRODUCTS

**Heinz Baumann, Kleinniedesheim, Fed. Rep. of Germany, assignor to Schaum-Chemie Wilhelm Bauer G.m.b.H. & Co. KG, Essen, Fed. Rep. of Germany**

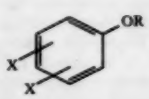
**Filed Feb. 26, 1982, Ser. No. 352,721**

**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108279**

**Int. Cl.³ C08J** *9/30*

**U.S. Cl. 521—106** **8 Claims**

1. In the preparation of a foamed amino-resin by reacting an aminoplast precondensate with a hardener, and thereafter foaming, the improvement which comprises employing an aminoplast precondensate which contains an excess of formaldehyde or to which supplemental formaldehyde or another lower monoaldehyde or dialdehyde has been added in the absence of any additive selected from the group consisting of a mononuclear or binuclear phenol, phenolic ether, or acenaphthene derivative, thereafter hardening in the presence of a surfactant foamer, a compressor gas and at least one additive selected from the group consisting of a mononuclear or binuclear phenol, phenolic ether, or acenaphthene derivative of the formula



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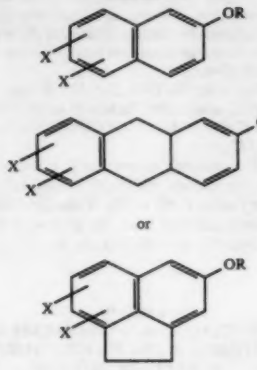

in which

X is H, OH, $SO_3H$, Cl, $CH_3$, or $C_2H_5$ and

R is H or an alkyl radical, with 1 to 9 carbon atoms, at a pH between about 1 and 2, and releasing the pressure whereupon a foamed amino resin is produced.

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**4,480,056**

## ORGANOTIN ANTIFOULING COATINGS WITH NOVOLAC AND BISPHENOL-A EPOXY RESINS

**Albert R. Parks, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 29, 1981, Ser. No. 278,782**

**Int. Cl.³ C08L** *33/02;* **A61K** *31/74*

**U.S. Cl. 523—122** **1 Claim**

1. A marine antifouling coating formulation consisting essentially of, by weight:

from about 20% to about 55% of the esterification product produced by reacting tributyltin oxide with a copolymer of styrene and maleic anhydride, wherein about 0.4 to about 0.8 moles of said oxide are combined with each mole of said copolymer;

from about 7% to about 36% solvent;

from about 12% to about 32% of a diglycidyl ether of Bisphenol-A epoxy having an average epoxy equivalent weight of between about 170 and 250;

from about 6% to about 30% of a novolac type epoxy having an average epoxy equivalent weight of between about 170 and 215;

from about 10% to about 20% of an amido amine accelerator;

from about 2% to about 8% filler; and

from about 2% to about 8% pigment.

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**4,480,057**

## IMPACT-RESISTANT POLY(PHENYLENE OXIDE) COMPOSITIONS COMPRISING ENCAPSULATED FILLER MATERIAL

**Hironari Sano, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Mie, Japan**

**Filed Dec. 14, 1982, Ser. No. 455,641**

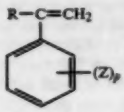
**Claims priority, application Japan, Dec. 15, 1981, 56-202065**

**Int. Cl.³ C08G** *71/04;* **C08K** *9/10;* **C08L** *25/10, 71/04*

**U.S. Cl. 523—206** **12 Claims**

1. An impact-resistant poly(phenylene oxide) composition comprising:

(a) a matrix comprising poly(phenylene oxide) or a mixture of poly(phenylene oxide) and a styrene-based polymer, which is a polymer having at least 25 mol % of the polymer units derived from a compound having the formula:



wherein R is hydrogen, a lower alkyl group, or a halogen, and Z is hydrogen, a lower alkyl group, chlorine, or vinyl and p is an integer from 1 to 5, and

(b) dispersed in said matrix, a dispersed phase comprising a synthetic resin and a particulate inorganic filler, said synthetic resin dispersed phase substantially completely surrounding said each filler particle or aggregate thereof and being selected from the group consisting of

(i) a crystalline olefin polymer phase comprising a functional derivative of a crystalline olefin polymer containing functional groups having an affinity for both said inorganic filler and a blend of said functional derivative of a crystalline olefin polymer with an underivatized crystalline olefin polymer, and,

interposed between said crystalline olefin polymer phase and said matrix, a crystalline or elastomeric hydrogenated styrene-conjugated diene polymer, and

(ii) a crystalline hydrogenated styrene-conjugated diene polymer phase comprising a functional derivative of a hydrogenated styrene-conjugated diene polymer containing functional groups having an affinity for both said inorganic filler and a blend of said functional derivative of a hydrogenated styrene-conjugated diene polymer with an underivatized crystalline hydrogenated styrene-conjugated diene polymer.

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4,480,058

## AQUEOUS EPOXY ESTER EMULSIONS

Vincent W. Ting, Boulder, Colo., and Richard M. Marcinko, North Royalton, Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 212,849, Dec. 4, 1980,. This application Jan. 6, 1981, Ser. No. 222,933

Int. Cl.³ C08L 63/00

U.S. Cl. 523—404 43 Claims

1. A nongelled hydroxy ester copolymer composition substantially free of oxirane functionality comprising an acidic copolymer-epoxy resin hydroxy ester reaction product produced by esterifying an acidic copolymer with an epoxy resin in the presence of amine catalyst in amounts larger than 2% by weight of reactants subjected to esterification to avoid a useless gel, the epoxy resin being a mixture containing at least 5% by weight of aromatic polyether which is difunctional in oxirane functionality which is consumed by reaction with the acidic copolymer and the acidic copolymer being a solution copolymer of monoethylenically unsaturated monomers comprising at least about 20% of monoethylenically unsaturated carboxylic acid, based on the total weight of monomers, the epoxy resin mixture constituting at least about 40% of the total resin solids content and providing oxirane functionality in a stoichiometric deficiency with respect to carboxyl functionality in the acidic copolymer of from 1:2 to 1:20, at least a portion of the carboxyl functionality in the copolymer-epoxy resin hydroxy ester reaction product being reacted with a base to render the reaction product self-emulsifiable in water.

4,480,059

## EPOXY ADHESIVES FOR POLY(BUTYLENE TEREPHTHALATE)

Charles D. Dudgeon, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,763

Int. Cl.³ C08G 59/68, 59/62

U.S. Cl. 523—466 7 Claims

1. An improved heat curable adhesive composition for bonding poly(butylene terephthalate) resin substrates consisting of:

(a) at least one epoxidic prepolymer containing two or more epoxy groups;

(b) an effective amount of an aromatic halonium complex salt thermal initiator dissolved in a compatibilizing non-expoxidic organic liquid; and

(c) a catalytic amount of a copper carboxylate salt cocatalyst,

wherein the improvement comprises the addition from about 1 to about 20 parts by weight of the overall composition of a polyhydric alcohol wherein said polyhydric alcohol is a difunctional alcohol selected from compounds of the formula HO—R—OH, wherein R is $(CH_2)_n$, where n is an integer of from 2 to 10, or R represents a group, $—(CH_2)_n—O—(CH_2)_n—$, where n is the same as defined above, whereby upon heating the polyhydric alcohol acts initially to soften and render the surface of the poly(1,4-butylene terephthalate) tacky to increase its receptivity to bonding and then the alcohol reacts with the epoxy groups and becomes an integral part of the adhesive.

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4,480,060

## MICA-RESIN COMPOSITE MATERIAL

Syed N. Hoda, Horseheads, and Anthony R. Olszewski, Bath, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,572

Int. Cl.³ C08K 3/34

U.S. Cl. 523—466 19 Claims

1. The method of forming a composite body composed of ion-exchanged, synthetic mica crystals and an organic resin which comprises the steps of,

providing in flocculated form an ion-exchanged, synthetic, lithium and/or sodium, crystalline mica, the mica being selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron phlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, fluorpolylithioinite, polylithionite, phlogopite, and fluorphlogopite,

converting the floc to particulate form,

mixing the particulate floc with an organic resin in particulate form and in such amount that the processed composite has a greater mechanical strength than similarly processed floc alone, and contains at least 50% floc

dispersing the mixture in a solvent,

drying the dispersed mixture, and

pressing the dried mixture to desired form at an elevated temperature and pressure.

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4,480,061

## WOOD-LIKE ARTICLES MADE FROM CELLULOSIC FILLER LOADED ETHYLENE INTERPOLYMERS

Michael C. Coughlin, and Timothy T. Schenck, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1982, Ser. No. 453,952

Int. Cl.³ C08K 5/01; B32B 27/30, 27/32

U.S. Cl. 524—13 17 Claims

1. An article having wood-like appearance and sufficiently high stiffness for a wood stubstitute made of a composition comprising

(a) from about 15 to about 55% by weight of at least one

copolymer of ethylene with at least one comonomer selected from the group consisting of salts of unsaturated mono- and dicarboxylic acids of 3 to 5 carbon atoms, optionally said copolymer of ethylene may contain additional comonomer selected from the group consisting of esters of said unsaturated acids wherein the alcohol moiety has 1 to 8 carbon atoms and vinyl esters of saturated carboxylic acids wherein the acid moiety has up to 4 carbon atoms, the ethylene content of said copolymer being from about 40 to about 95% by weight, the comonomer content of said copolymer being from about 5 to about 60% by weight, and the melt index of said copolymer being from about 0.1 to about 150 g/10 min;

(b) from about 1 to about 15% by weight of at least one plasticizer selected from the group consisting of processing oils, epoxidized oils, polyesters, polyethers, and polyether esters;

(c) from about 20 to about 70% by weight of cellulosic filler;

(d) from 0 to about 10% by weight of at least one additive selected from the group consisting of organic acids, organic acid derivatives and surface active agents; and

(e) from 0 to about 44% by weight of olefin polymer selected from the group consisting of low density branched polyethylene, high density linear polyethylene, linear copolymers of ethylene and another olefin comonomer, polypropylene and copolymers of propylene and ethylene where the ethylene content is up to 20% by weight.

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4,480,062

## ELASTOMERIC COMPOSITION

Arnis U. Paeglis, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,376
Int. Cl.³ C08K 5/09
U.S. Cl. 524—394 26 Claims

1. An elastomeric composition comprising:

100 parts of a neutralized sulfonated elastomeric polymer containing 10 to 50 milliequivalents neutralized sulfonate groups per 100 grams of elastomeric polymer, said neutralized sulfonate groups containing a cation selected from the group consisting of ammonium, antimony, aluminum, iron, lead, a metal of Group IA, IIA, IB or IIB of the Periodic Table of Elements and mixtures thereof;

40 to 250 parts of a non-polar process oil;

5 to 50 parts of a preferential plasticizer selected from the group consisting of a basic salt of a carboxylic acid having 2 to 30 carbon atoms, said salt containing a cation selected from the group consisting of antimony, aluminum, iron, lead, a metal of Group IA, IIA, IB or IIB of the Periodic Table of Elements and mixtures thereof and an organic amide having the formula $R^1CONR^2R^3$ where $R^1$ is an aliphatic group and $R^2$ and $R^3$ are the same or different and are hydrogen, alkyl, aryl, aralkyl or the group $-CH_2CH_2NHCOR^1$, and where at least one of $R^1$, $R^2$ and $R^3$ has at least 5 carbon atoms; and

at least 65 parts of carbon black;

all said parts being by weight.

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4,480,063

## POLYMER COMPOSITIONS BASED ON SULFONATED IONOMERS AND AMINE CONTAINING POLYMERS

Robert D. Lundberg, Bridgewater; Dennis G. Peiffer, East Brunswick, and Robert R. Phillips, Spring Lk. Heights, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 2, 1983, Ser. No. 547,911
Int. Cl.³ C08K 5/05, 5/01; C08L 91/00
U.S. Cl. 524—399 26 Claims

1. A composition comprising having a viscosity at 0.73 $sec^{-1}$ at 200° C. of about 5000 poise to about $5\times10^6$ poise comprising interacting a blend of a neutralized sulfonated polymer containing from about 4 meq. of metal sulfonate per 100 g. of polymer up to 200 meq. per 100 g. of polymer, said sulfonate polymer being at least 95% neutralized, complexed with an amine-containing polymer, said polymer containing a minimum of three basic groups per polymer molecular, said basic nitrogen content of said amine containing polymer being from about 4 meq. up to 500 meq. per 100 g. of polymer, wherein the molar ratio of metal sulfonate groups to that of basic nitrogen atoms is from about 0.03 to about 30.

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4,480,064

## COLOR PIGMENT FOR USE IN THE PRODUCTION OF THERMOPLASTIC ARTICLES

Kuldip S. Chopra, Grand Island, N.Y.; George E. Ealer, and George A. Salensky, both of Whitehouse Station, N.J., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 376,165, May 7, 1982, abandoned, which is a continuation of Ser. No. 162,956, Jun. 25, 1980, abandoned. This application Nov. 7, 1983, Ser. No. 549,284
Int. Cl.³ C08K 3/22
U.S. Cl. 524—413 6 Claims

1. An improved method for producing colored polyethylene thermoplastic articles which comprises the steps of forming a mixture consisting essentially of polyethylene thermoplastic resin together with at least one color pigment of finely-divided manganomanganic oxide fume, in amounts such that said polyethylene thermoplastic articles will contain from about 0.1% to 20% by weight of said pigment, said finely-divided manganomanganic oxide fume having spherical particles of a size of between about 0.1 and about 4.0 microns, heating the mixture to elevated temperatures in order to melt the polyethylene thermoplastic resin and to uniformly disperse the color pigment throughout the resin and then shaping the polyethylene thermoplastic resin into the finished article.

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4,480,065

## POLYPROPYLENE-BASE RESIN COMPOSITION

Yoichi Kawai; Yoshihisa Gotoh, both of Yokohama; Masami Maki, Kawasaki; Akio Yoshihara, Yokohama; Minoru Hoshino, Kawasaki, and Katsumi Sekiguchi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,255
Claims priority, application Japan, Jun. 4, 1982, 57-94765
Int. Cl.³ C08K 3/00, 00/00; C08L 23/16, 53/00
U.S. Cl. 524—418 5 Claims

1. A polypropylene resin composition which comprises:

(a) 80–60 wt.% of a crystalline ethylene-propylene block copolymer having an ethylene content of 11–30 wt.%, polypropylene units insoluble in boiling n-heptane of 75 wt.% or more, an intrinsic viscosity of 1.2–2.0 as measured as a tetraline solution (135° C.) and a melt flow index of 8 or greater;

(b) 5–35 wt.% of an ethylene-propylene copolymer rubber having a propylene content of 20–50 wt.% and a Mooney viscosity ($ML_{1+4}$, 100° C.) of 20–100;

(c) 5–35 wt.% of an ethylene-propylene-diene terpolymer having a propylene content of 20–50 wt.% and a Mooney viscosity ($ML_{1+4}$, 100° C.) of 20–110, said diene being ethylidene norbornene, dicyclopentadiene or 1,4-hexadiene; and

(d) 2–5 wt.% based on the total weight of the above resin components (a), (b) and (c) of an inorganic filler having a particle size of 3 μm or smaller.

4,480,066

## RUBBER COMPOSITIONS AND ARTICLES THEREOF HAVING IMPROVED METAL ADHESION AND METAL ADHESION RETENTION

James A. Davis, Uniontown, and Robert C. Koch, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 18, 1983, Ser. No. 524,496
Int. Cl.³ C08L 7/00, 9/00, 9/06, 15/02
U.S. Cl. 524—439 5 Claims

1. A brass or brass-plated metallic reinforced vulcanizable rubber composition suitable for rubber plies essentially free of transition metal adhesion promoting additives having improved metal adhesion and metal adhesion retention properties with brass and brass-plated reinforcing elements, wherein the improvement comprises:

substituting at least about 10.0 parts by weight of a halogenated rubber for the rubber present in said vulcanizable composition so as to provide 100 parts of rubber;

wherein said halogenated rubber is selected from the group consisting of fluorocarbon elastomers and chlorosulfonated polyethylene; and,

wherein said rubber in said vulcanizable rubber composition is selected from the group consisting of natural rubber, synthetic rubber and rubber blends thereof and wherein said vulcanizable rubber composition contains at least 40 to 50 percent of natural rubber.

3. A method for improving metal adhesion and metal adhesion retention properties between a vulcanizable rubber composition, essentially free of transition metal adhesion promoting additives, and brass or brass-plated metallic reinforcing elements comprising the steps of:

blending at least about 10.0 parts by weight of a halogenated rubber with up to about 90.0 parts by weight of a vulcanizable rubber essentially free of other halogenated rubber; and

curing said blend of rubbers with said brass or brass-plated metallic reinforcing elements embedded in said rubber composition;

wherein said halogenated rubber is selected from the group consisting of bromobutyl rubber, chlorobutyl rubber, fluorocarbon elastomer and chlorosulfonated polyethylene; and,

wherein said rubber in said vulcanizable rubber composition is selected from the group consisting of natural rubber, synthetic rubber and blends thereof and wherein said vulcanizable rubber composition contains at least 40 to 50 percent of natural rubber.

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4,480,067

## IMPEDING SEDIMENTATION OF CLAYS IN WATER

Lino Vio, Pau, and Gilles Meunier, Lescar, both of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed Aug. 24, 1983, Ser. No. 526,050
Claims priority, application France, Dec. 31, 1982, 82 22181
Int. Cl.³ C08K 5/16
U.S. Cl. 524—446 17 Claims

1. A method of impeding the sedimentation of clays in a water containing the same, which consists in adding to the water a slight amount of a polymer which bears hydroxamic groups attached to a linear hydrocarbon chain.

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4,480,068

## HIGH TEMPERATURE RESISTANT BINDERS

Ruben A. Santos, Sarnia; William G. Kipp, Courtright, and Edwin J. MacPherson, Sarnia, all of Canada, assignors to Fiberglas Canada Inc., Ontario, Canada

Filed Sep. 14, 1981, Ser. No. 302,256
Int. Cl.³ C08K 3/28, 3/38; C08L 6/10
U.S. Cl. 524—456 33 Claims

1. A method of preparing a high temperature resistant, thermosetting, water-dilutable binder composition suitable for use in a binder system for mineral fibers, comprising mixing at a temperature of about 20° to 80° C. in an aqueous medium

(a) a mixture of 1 mole of boric acid and about 0.9 to 2 moles of soluble hydroxyl compound chosen from diol, polyol, aldose and ketose;

(b) about 0.5 to 1.5 moles of a nitrogen containing compound chosen from dicyandiamide, melamine and guanidine; and

(c) a phenol-formaldehyde resol to which urea has been added; said phenol-formaldehyde resol-urea mixture having a pH in the range of 7.5 to 10; and being added in a weight ratio of between 2:1 and 3:1 to the weight of components (a) and (b), and containing urea in the ratio of phenol-formaldehyde to urea between 70:30 and 40:60 parts by weight, and said phenol-formaldehyde resol having a phenol to formaldehyde molar ratio of between 1:3 and 1:4.5;

and adjusting the Ph of the final composition to fall in the range of about 8.5 to 9.5.

19. A high temperature resistant, thermosetting, water-dilutable binder composition suitable for use in the manufacture of thermally stable bonded mineral fiber structures, comprising in a ratio of between 1:2 and 1:3 parts by weight of boric acid-hydroxyl-amide component and a phenol-formaldehyde resol to which urea has been added, said composition having a pH adjusted to fall in the range of about 8.5 to 9.5, said boric acid-hydroxyl-amide component being prepared by mixing at a temperature of about 20° to 80° C. in an aqueous medium 1 mole of boric acid with about 0.9 to 2 moles of a soluble hydroxyl compound chosen from diol, polyol, aldose and ketose and adding 0.5 to 1.5 moles of a nitrogen containing compound chosen from dicyandiamide, melamine and guanidine; and said phenol-formaldehyde resol-urea mixture having a pH in the range of 7.5 to 10 and containing urea in a ratio of phenol-formaldehyde to urea between 70:30 and 40:60 parts by weight, and said phenol-formaldehyde resol having a phenol to formaldehyde molar ratio of between 1:3 and 1:4.5.

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4,480,069

## NON-AQUEOUS DISPERSIONS BASED ON CAPPED STABILIZERS AND VINYL MONOMERS I

Ares N. Theodore, Farmington Hills, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/00014, § 371 Date Jan. 5, 1983, § 102(e) Date Jan. 5, 1983
PCT Filed Jan. 5, 1983, Ser. No. 465,856
Int. Cl.³ C08J 3/02; C08L 51/00, 51/06, 51/08
U.S. Cl. 524—504 14 Claims

1. A stable dispersion characterized in that said particles are formed by addition polymerization of:

(a) between about 0.8 and other 20 weight percent each of first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other; and

(b) between about 98.4 and about 60 weight percent of at least one other monoethylenically unsaturated monomer; in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer containing at least two segments with one segment being solvated by said organic liquid and the second segment being of different polarity than said first segment and relatively insoluble in said organic liquid, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer first forms and then is crosslinked, wherein the precursor of said first segment of said stabilizer comprises a long chain hydrocarbon molecule having only one reactive group per said molecule.

14. Crosslinked polymer particles obtained by the removal of said solvent from said dispersion formed in claim 1.

## 4,480,070
## COMPOSITIONS AND PROCESS

**Filippus Bosscher, Wageborgen, Netherlands; John Penfold, Engelburg; Klaus W. Reich, Eggersriet, both of Switzerland, and Albertus Zandvoort, Holwierde, Netherlands, assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation of Ser. No. 383,024, May 28, 1982, abandoned. This application Jun. 27, 1983, Ser. No. 507,956**
**Int. Cl.³ C08L 75/07**
**U.S. Cl. 524—591** **6 Claims**

1. An isocyanate composition capable of yielding an emulsion on admixture with water said composition comprising the product of reaction of

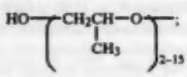
(a) a polymethylene polyphenyl polyisocyanate containing from about 10 to about 90 percent by weight of methylenebis(phenyl isocyanate) the remainder of said polyisocyanate comprising oligomeric polymethylene polyphenyl polyisocyanates of functionality greater than 2.0; and

(b) from 0.001 to 0.2 equivalents, per equivalent of said polyisocyanate, of a hydroxyl containing compound selected from the class consisting of

(i) at least one compound having the formula

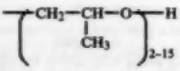
$$R^1\text{-}(CH_2CH_2O)_{7-25}\text{-}R^2 \qquad (I)$$

wherein $R^1$ represents a group selected from the class consisting of alkoxy, carbalkoxy, aryloxy and



and

$R^2$ represents a group having the formula



## 4,480,071
## ISOCYANATE-COUPLED REINFORCED OXYMETHYLENE POLYMERS

**Kavilipalayam Natarajan, Irvington, and Daniel Zimmerman, East Brunswick, both of N.J., assignors to Celanese Corporation, New York, N.Y.**

**Filed Sep. 19, 1983, Ser. No. 533,077**
**Int. Cl.³ C08K 3/40**
**U.S. Cl. 524—593** **20 Claims**

1. A molding composition comprised of an oxymethylene polymer having at least 60 percent of recurring oxymethylene units, a blocked or unblocked isocyanate compound in an amount ranging from about 0.2 to 2.0 percent by weight based on the weight of the polymer, a non-reinforcing, particulate filler and an isocyanate-active catalyst.

## 4,480,072
## USE OF ETHYL SILICATE AS A CROSSLINKER FOR HYDROXYLATED POLYMERS

**Charles B. Mallon, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.**

**Continuation-in-part of Ser. No. 356,783, Mar. 10, 1982, abandoned. This application Aug. 30, 1983, Ser. No. 527,832**
**Int. Cl.³ C08F 8/00**
**U.S. Cl. 525—61** **10 Claims**

1. Method of enhancing the solvent resistance, flexibility and hardness of hydroxylated polymers selected from the group consisting of hydrolized vinyl chloride/vinyl acetate copolymers, vinyl chloride/vinyl acetate/hydroxyalkyl acrylate copolymers, thermoplastic polyhydroxyethers derived from bisphenol A and epichlorohydrin, hydroxyalkyl acrylic or methacrylic acid polymers and polyester polyol polymers derived from organic carboxylic acids and polyhydric alcohols, which comprises blending said hydroxylated polymers with an alkyl silicate or alkyl silicate hydrolyzate in the presence of a trace amount of acid and thereafter curing the resultant mixture.

## 4,480,073
## THERMOPLASTIC COMPOSITION CONTAINING A POLY(METHYL ETHENYL BENZENE) RESIN AND A POLY(PHENYLENE OXIDE) RESIN

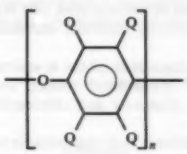
**Robert V. Russo, Brooklyn, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 119,901, Feb. 8, 1980, Pat. No. 4,284,733. This application Jul. 13, 1981, Ser. No. 282,627**
**The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.**
**Int. Cl.³ C08L 61/04**
**U.S. Cl. 525—68** **6 Claims**

1. A polymeric composition comprising homogeneous and compatible blend of about

(a) 20 to 99 weight percent of a high impact copolymer comprising 5 to 10 weight percent of a polybutadiene backbone and grafted thereto polymeric units derived from a mixture of isomers of methyl ethenyl benzene consisting essentially of 0 to 0.05 weight percent 1-methyl-2-ethenyl benzene, 1 to 5 weight percent 1-methyl-3-ethenyl benzene, and at least 95 weight percent 1-methyl-4-ethenyl benzene; and

(b) 80 to 1 weight percent of a poly(phenylene oxide) resin having the formula



were each Q independently is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least two carbon atoms between the halogen atom and phenyl nucleus, or halogen, provided that each is free of a tertiary carbon atom; and n is at least 20.

## 4,480,074
## PROCESS FOR PREPARING ELASTOPLASTIC COMPOSITIONS

**Yun L. Wang, Wadsworth, Ohio, assignor to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 20, 1982, Ser. No. 435,540**
**Int. Cl.³ C08L 23/26, 23/30, 23/36**
**U.S. Cl. 525—194** **8 Claims**

1. A process for preparing an elastoplastic composition which comprises dynamically vulcanizing a blend comprising (a) an elastoplastic composition, prepared by dynamic vulcanization, comprising a blend of about 25 to 50 parts by weight of crystalline polyolefin resin and, correspondingly, about 75 to 50 parts by weight of vulcanized monoolefin copolymer rubber, and (b) unvulcanized but vulcanizable monoolefin copolymer rubber composition comprising monoolefin copolymer rubber in an amount so that after vulcanization the final composition (c) comprises a blend of about 15 to 45 parts by weight of crystalline polyolefin resin and, correspondingly, about 85 to 55 parts by weight of vulcanized monoolefin copolymer rubber.

4,480,075

## BLOCK COPOLYMERS OF ZIEGLER-NATTA POLYMERIZED AND ANIONICALLY POLYMERIZED MONOMERS

Carl L. Willis, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1983, Ser. No. 507,382
Int. Cl.³ C08F 297/04, 297/06
U.S. Cl. 525—247 34 Claims

1. A process for preparing living multi-block copolymers comprising;

(a) combining under polymerization conditions one or more alpha olefin monomers in a suitable diluent in the presence of a Ziegler-Natta catalyst system and a transmetallation reagent selected from the group consisting of dialkyl zinc, dialkyl cadmium, tetralkyl lead, and their salts,

(b) contacting the resulting polymer with an anionic transfer reagent generating an anionic polymerization initiator thereby forming living polymer chains,

(c) contacting the resulting living polymer chains sequentially with one or more monomers selected from the group consisting of conjugated dienes, and monoalkenylarenes and activated mono olefins;

(d) recovering multi-block copolymers.

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4,480,076

## FLEXIBLE THERMOPLASTIC VINYL CHLORIDE POLYMERS

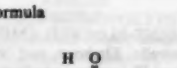
Earl G. Melby, Uniontown; Hubert J. Fabris, Akron; Russell A. Livigni, Akron, and Harry W. Cocain, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Jun. 21, 1982, Ser. No. 390,109
Int. Cl.³ C08F 259/04; C08L 27/06, 33/08, 33/12
U.S. Cl. 525—261 9 Claims

1. The method which comprises, in aqueous media containing a free radical initiator and suspension polymerized vinyl chloride polymer, contacting said polymer with copolymerizable monomers consisting essentially of A, B and C at a temperature below polymerization temperature for a period of time sufficient to swell said vinyl chloride polymer with said monomers and then suspension graft or over polymerizing said vinyl chloride polymer with said polymerizable monomers, said suspension optionally additionally containing a protective colloid, said suspension optionally additionally containing a chain transfer agent in a minor amount sufficient to avoid formation of gel, to form a plasticized vinyl chloride polymer, said suspension polymerized vinyl chloride polymer being used in an amount of from about 40 to 60% by weight and said polymerizable monomers A, B and C being used in a total amount of from 60 to 40% by weight, the relative ratios of A, B and C to each other on a percent by weight basis being from about 24 to 94 of A, from about 1 to 75 of B and from about 1 to 20 of C, the total of A, B and C being 100,

where said vinyl chloride polymer is selected from the group consisting of homopolyvinyl chloride, a copolymer of vinyl chloride and vinyl acetate containing up to about 50% by weight of vinyl acetate, and a copolymer of vinyl chloride and vinylidene chloride containing up to about 50% by weight of vinylidene chloride and mixtures of the same,

where A has the formula



where R is an alkyl group of from 4 to 8 carbon atoms and mixtures of A, said A as a homopolymer having a Tg of not above about −20° C.,

where B is selected from the group consisting of methyl acrylate, ethyl acrylate, tetrahydrofurfuryl acrylate and tetrahydrofurfuryl methacrylate and mixtures of the same and

where C is selected from the group consisting of acrylonitrile, methacrylonitrile, N-vinyl-2-pyrrolidone and vinyl-alpha-methyl pyrrolidone and mixtures of the same.

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4,480,077

## HEAT RESISTANT VINYL ESTER RESIN COMPOSITION

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 12, 1982, Ser. No. 433,573
Int. Cl.³ C08L 63/10
U.S. Cl. 525—530 8 Claims

1. A curable resinous composition comprising

A. about 5 to about 95 weight percent of a vinyl ester resin having terminal polymerizable vinylidene groups or a mixture of vinyl ester resins, and

B. about 95 to about 5 weight percent of an unsaturated mixture consisting of 20 to 80 weight percent of an ethylenically unsaturated monomer and 80 to 20 weight percent of a dicyclopentadiene or polycyclopentadiene bis or tris ester of an unsaturated polycarboxylic acid having one of the formulae

I.

II.

where

$R_1$ is $=CH_2$ or $=C(CH_3)—CH_3$

$R_2$ is hydrogen or $—CH_2—COOH$

$R_3$ is hydrogen when $R_2$ is a $—CH_2—COOH$ group, or $—COOH$.

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4,480,078

## CONTINUOUS EMULSION POLYMERIZATION PROCESS

Ramesh N. Gujarathi, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 427,367, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 304,743, Sep. 23, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,313
Int. Cl.³ C08F 265/02
U.S. Cl. 526—65 7 Claims

1. A catalyzed continuous emulsion polymerization process for the production of a latex from components (a), (b), and (c) comprising: (a) at least one conjugated diene, (b) at least one non-carboxylic comonomer, (c) at least one ethylenically unsaturated polycarboxylic acid selected from the group consisting of maleic acid, fumaric acid and iticonic acid; wherein the percent by weight of (c) to (a) and (b) can range from at least 1 to 5; the polymerization reaction is carried out in two or more reaction zones in which all of component (c) and from 25 to 75 percent by weight of components (a) and (b) are polymerized in the first reaction zone at a pH of 1.5 to 2.5 to a conversion of 85 to 98 percent; the reaction is continued in a second zone, to which is supplied the balance of components (a) and (b) which is then polymerized to 85 to 95 percent conversion of total monomers charged followed by removing the reaction mixture from the second to a third reaction zone wherein the reaction mixture is polymerized to essentially complete monomer conversion.

**4,480,079**

## COPOLYMERIZATION OF UNSATURATED URETHANE MONOMERS

**Michael L. Orton, Northwich, and William I. Spurr, Warrington, both of England, assignors to Imperial Chemical Industries PLC, London, England**

**Continuation-in-part of Ser. No. 367,617, Apr. 12, 1982, abandoned. This application Nov. 1, 1982, Ser. No. 438,348**

**Int. Cl.³ C08F** *26/02, 226/02*

**U.S. Cl. 526—301** **24 Claims**

1. A method of producing a moulded plastics product by in-mould copolymerisation of an unsaturated urethane compound and a vinyl monomer copolymerisable therewith, wherein

(a) the unsaturated urethane compound is a polyurethane polyacrylate or polymethacrylate resin derived from a hydroxyalkyl acrylate or methacrylate by reaction of hydroxyl groups thereof with the isocyanate groups of a polyisocyanate from the group consisting of

(i) polyisocyanates free from urethane groups and having an isocyanate functionality greater than 2.0 and

(ii) urethane polyisocyanate derived from a polyisocyanate by reaction thereof with the hydroxyl groups of an aliphatic alcohol having up to 3 hydroxyl groups, the said urethane polyisocyanates having an isocyanate functionality greater than 2.0 and

(b) the vinyl monomer is methyl methacrylate.

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**4,480,080**

## VINYL-ESTER POLYMERIC TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES

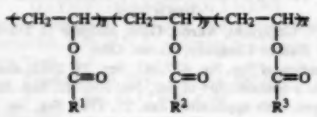
**David B. Bailey, and Edward P. Abel, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 462,501, Jan. 31, 1983, Pat. No. 4,440,848. This application Oct. 24, 1983, Ser. No. 546,241**

**Int. Cl.³ C08F** *12/22, 28/02, 22/10, 30/02*

**U.S. Cl. 526—318** **4 Claims**

1. A polymer comprising the following recurring units:



wherein

$R^1$ is a straight or branched chain alkyl group of from 1 to about 10 carbon atoms or aralkyl group of from about 7 to about 10 carbon atoms;

$R^2$ is a substituted or unsubstituted aryl group of from 6 to about 12 carbon atoms;

$R^3$ is a straight or branched aliphatic group having from 1 to about 20 carbon atoms or an aromatic group having from about 6 to about 20 carbon atoms, said group being substituted with at least one free carboxylic acid group, free sulfonic acid group, free phosphoric acid group or salt thereof;

x is from about 1 to about 30 weight percent; and

y+z is from about 99 to about 70 weight percent, the ratio of y:z ranging from about 15:85 to about 70:30.

2. The polymer of claim 1 wherein $R^1$ is methyl, ethyl or propyl, $R^2$ is phenyl, chlorophenyl or cyanophenyl and $R^3$ is carboxybutyl, carboxyhexyl or carboxyethyl.

3. The polymer of claim 1 wherein $R^1$ is methyl, $R^2$ is phenyl and $R^3$ is carboxybutyl.

**4,480,081**

## ISOCYANATE-REACTIVE COMPOUNDS FROM MODIFIED TDI DISTILLATION RESIDUE INTERMEDIATES AND POLYURETHANES PREPARED THEREFROM

**Michael L. Rosin, Madison; James M. O'Connor, Clinton; Wilhelm J. Schnabel, Branford, and Robert M. Early, North Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Dec. 29, 1983, Ser. No. 566,921**

**Int. Cl.³ C08G** *18/77*

**U.S. Cl. 528—49** **32 Claims**

1. A process for preparing an isocyanate-reactive compound, comprising the steps of:

(a) reacting TDI distillation residue with a monohydroxylic compound in an equivalent ratio of OH to NCO ranging from about 0.2/1 to about 0.9/1 to form a modified TDI distillation residue intermediate, said TDI distillation residue being obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate, and then

(b) reacting said modified TDI distillation residue intermediate with a polyol in such proportions as to obtain a reaction product having an OH-number (mg KOH/g) of about 200 to about 700.

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**4,480,082**

## EPOXY RESIN FORTIFIERS BASED ON AROMATIC AMIDES

**Paul D. McLean, Nepean; Andrew Garton, Ottawa; Robert F. Scott, and Susan E. Gransden, both of Nepean, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada**

**Filed Jul. 25, 1983, Ser. No. 516,575**

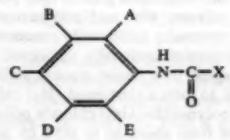
**Claims priority, application Canada, Aug. 12, 1982, 409315**

**Int. Cl.³ C08G** *59/50, 51/04;* **C08L** *63/00*

**U.S. Cl. 528—103** **17 Claims**

1. A fortifier for epoxy resins comprising the reaction product of

(i) an aromatic amide of the formula



wherein A to E are selected from hydrogen, hydroxyl, halogen, lower alkyl, halogenated lower alkyl, amino, and an alkylene-linked aromatic amide moiety; and X is selected from hydrogen, lower alkyl, phenyl and



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**4,480,083**

## OXAZOLIDINE-BLOCKED AMINE POLYMERS

**Anthony J. Tortorello, Elmhurst, and Nestor P. Hansen, Mt. Prospect, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.**

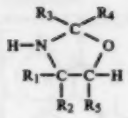
**Filed Mar. 21, 1983, Ser. No. 477,432**

**Int. Cl.³ C08G** *59/40, 59/56*

**U.S. Cl. 528—111** **16 Claims**

1. A protonated adduct reaction product which is an adduct of:

(1) an oxazolidine having the formula:



where $R_1$, $R_2$ and $R_5$ are selected from hydrogen and $C_1$–$C_{10}$ alkyl, and $R_3$ and $R_4$ are the residue of a ketone or aldehyde used to form the oxazolidine compound by a reaction involving the removal of water;

(2) an organic polyepoxide having a 1,2-epoxy equivalency of at least about 1.2; said oxazolidine being present in an amount sufficient to react with at least 10% of the 1,2-oxirane groups in said polyepoxide; and said adduct being reacted with

(3) an acid to protonate at least 50% of the amine groups therein.

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**4,480,084**

## POLYMERIC LIGHT STABILIZERS

**Panagiotis I. Kordomenos, Mt. Clemens; Delores J. Alexander, Southfield, and David M. Thomson, Mt. Clemens, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Oct. 13, 1983, Ser. No. 553,321**

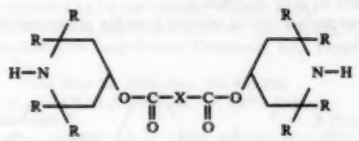
**Int. Cl.³ C08G *59/50, 65/26*; C08K *5/34***

**U.S. Cl. 528—118** **8 Claims**

1. A crosslinkable polymeric hindered amine light stabilizer characterized in that said stabilizer has a number average molecular weight ($\overline{M}_n$) of between about 500 and about 2000 and contains at least two, on average, primary hydroxyl groups, said stabilizer being the reaction product of:

(A) epoxy resin containing, on average, two epoxide groups per molecule; and

(B) polyalkylpiperidine being selected from compounds represented by the chemical formula:



wherein each R is selected from any $C_1$–$C_6$ alkyl group and X is a group containing between about two and about 36 carbon atoms, and wherein said epoxy resin and said polyalkylpiperidine are reacted in a molar ratio of between about 6:5 and about 2:1 so as to form an epoxide functional polymer having on average, two epoxide groups per molecule; and

(C) monomer containing at least one primary hydroxyl group and a reactive functionality capable of reacting with the epoxide groups of said epoxide functional polymer, wherein said monomer is employed in amounts which are sufficient to react essentially all of the epoxide groups present on said epoxide functional polymer.

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**4,480,085**

## AMORPHOUS SULFOPOLYESTERS

**Wayne K. Larson, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Sep. 30, 1983, Ser. No. 537,829**

**Int. Cl.³ C08G *63/68, 75/00***

**U.S. Cl. 528—295** **5 Claims**

1. An amorphous sulfopolyester comprising the esterification product of at least one organic diol and at least one carboxylic acid wherein at least about 35 mole percent of said carboxylic acid is selected from the group consisting of ortho-arylene and peri-arylene carboxylic acids, the arylene group thereof having from 6 to 14 carbon atoms, and wherein from about 1.0 to about 15.0 mole percent of the total moles of said diol and said carboxylic acid are sulfo groups.

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**4,480,086**

## RADIATION-RESISTANT COPOLYESTERS

**George J. O'Neill, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sep. 9, 1983, Ser. No. 530,812**

**Int. Cl.³ C08G *63/54***

**U.S. Cl. 528—295.3** **7 Claims**

1. Copolyester compositions derived from 100 mole % of a dicarboxylic acid component and 100 mole % of a glycol component, said copolyester consisting essentially of repeat units from about 65–100 mole % 1,4-cyclohexanedicarboxylic acid, about 65–100 mole % 1,4-butanediol and about 15–35 mole % of a compound selected from the group consisting of dimer acid and dimer glycol.

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**4,480,087**

## POLYESTER WAXES BASED ON ALKYLSUCCINIC ANHYDRIDE OR ALKENYLSUCCINIC ANHYDRIDE

**Jimmy R. Trotter; Frederick B. Joyner, and Richard L. McConnell, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 30, 1983, Ser. No. 509,534**

**Int. Cl.³ C08G *63/16***

**U.S. Cl. 528—302** **19 Claims**

1. A linear polyester wax composition having a melting point less than about 100° C., an inherent viscosity of from about 0.05 to about 0.39, a heat of fusion of from 0 to about 20 cal./g., and a melt viscosity of about 10 cp. to about 2000 cp. at 190° C. containing as the acid member at least about 75 mole percent alkylsuccinic anhydride or alkenylsuccinic anhydride, and the acid functioning derivatives thereof, and linear aliphatic and cycloaliphatic glycols having 2 to 10 carbon atoms as the diol member.

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**4,480,088**

## WATER SOLUBLE POLYIMIDE RESIN SYSTEM

**Roscoe A. Pike, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Oct. 20, 1983, Ser. No. 543,701**

**Int. Cl.³ C08G *73/10***

**U.S. Cl. 528—353** **5 Claims**

1. A process for producing an aqueous soluble polyimide precursor comprising:

preparing a solution of a polyamic acid in an organic solvent;

adding water to the solution to cause the polyamic acid to precipitate;

filtering the precipitated acid;

washing the precipitated acid with water to remove the organic solvent;

adding the washed acid to an aqueous solution of a water soluble amine, wherein the water soluble amine is present in quantities at least sufficient to dissolve the polyamic acid,

thus forming the water soluble amine salt of the polyamic acid.

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**4,480,089**

## MODIFIED CELLULOSE PRODUCTS BY BLEACHING

**Li F. Chen, and Parakkat Seethanathan, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.**

**Filed Jun. 14, 1983, Ser. No. 504,062**

**Int. Cl.³ C08B *1/00*; A61K *9/20*; D21C *9/10***

**U.S. Cl. 536—56** **24 Claims**

1. A method of making a modified cellulose product suitable for use as a carrier vehicle or bodying agent comprising the

steps of treating a fibrous cellulose material with an alkali metal or alkaline earth metal hypohalite at a temperature ranging from about 15° to about 60° C. in an aqueous medium for a period of time sufficient to render the material non-fibrous, the weight ratio of fibrous cellulose material to hypohalite being from about 10:1 to 1:1 and the aqueous medium being present in a sufficient quantity to achieve uniform wetting of the fibrous material, filtering and washing the reaction material to remove salts and obtain a modified cellulose product.

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**4,480,090**

## PROCESS FOR ESTERIFICATION OF CELLULOSE USING AS THE CATALYST THE COMBINATION OF SULFURIC ACID, PHOSPHORIC ACID AND A HINDERED ALIPHATIC ALCOHOL

**Chung-Ming Kuo, and Alan P. Leonard, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 21, 1983, Ser. No. 544,187**
**Int. Cl.³ C08B 3/02**
**U.S. Cl. 536—58** **7 Claims**

1. A catalyst composition for esterifying cellulose with lower fatty acids which comprises from about 0.2 to 1.5 parts phosphoric acid, from about 0.1 to 1.2 parts sulfuric acid, and from 0.05 to 0.6 parts of a hindered aliphatic alcohol by weight per 100 parts of said cellulose to be esterified.

2. A method of preparing lower fatty acid esters of cellulose which comprises esterifying at a temperature of between about 75° C. and about 110° C. said cellulose with an esterifying bath comprising an organic acid anhydride, a diluent, and as the catalyst mixture comprising from about 0.2 to 1.5 parts phosphoric acid, from about 0.1 to 1.2 parts sulfuric acid, and from 0.05 to 0.6 parts of a hindered aliphatic alcohol by weight per 100 parts of said cellulose to be esterified.

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**4,480,091**

## PROCESS FOR PREPARING CELLULOSE SULFATE ESTERS

**Richard J. Brewer, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 31, 1983, Ser. No. 547,262**
**Int. Cl.³ C08B 5/14**
**U.S. Cl. 536—59** **15 Claims**

1. A process for preparing cellulose sulfate esters from cellulose, cellulose derivatives containing at least one free hydroxyl group and mixtures thereof which comprises slurrying said cellulose, derivatives or mixtures thereof in at least about six parts of dimethylformamide per part cellulose component, reacting said slurry with at least 1.5 mole dinitrogen tetroxide per mole cellulosic anhydroglucose unit to form cellulose nitrite ester, reacting said cellulose nitrite ester with at least about 0.3 mole acetylsulfuric acid and adequate acetic anhydride to maintain the reaction mixture in an anhydrous state at a temperature of about 0° C. to about 40° C. to form water soluble cellulose sulfate esters.

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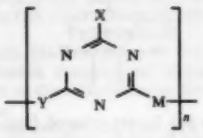
**4,480,092**

## ALKYLATED POLYALKYLENEPOLYAMINES, SUBSTITUTED OXO-PIPERAZINYL-TRIAZINES

**John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio**

**Filed Feb. 19, 1982, Ser. No. 350,536**
**Int. Cl.³ C07D 251/70, 251/52, 401/14, 403/12**
**U.S. Cl. 544—113** **13 Claims**

1. A class of compounds comprising polysubstituted piperazinones distally linked to a triazine nucleus ("PIP-T"), and bis compounds and oligomers of said PIP-T compounds represented by the structural formula



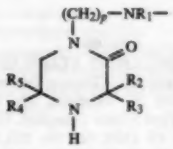
(I)

wherein,

n is an integer in the range from 1 to about 10, said compound having functional end groups selected from H, OH and Cl when

n is greater than 1;

X is a substituent having the following formula (II):



(II)

wherein,

$R_1$ represents alkyl having from 1 to about 24 carbon atoms, cycloalkyl having from 5 to about 7 carbon atoms, aralkyl having from 7 to about 20 carbon atoms, azaalkyl having from 1 to about 24 carbon atoms, and azacycloalkyl having from 6 to about 20 carbon atoms;

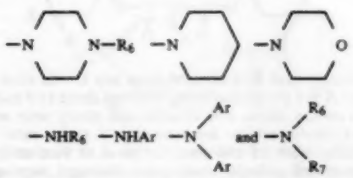
$R_2$, $R_3$, $R_4$ and $R_5$ independently represent alkyl having from 1 to about 24 carbon atoms;

p represents an integer in the range from 2 to about 10;

Y may be the same as X or M;

M may be Z or Z', wherein

Z represents a radical selected from the group consisting of Cl,

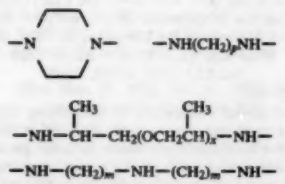


Ar = aryl,

$R_6$, $R_7$ represent alkyl having from 2 to about 24 carbon atoms;

Ar represents aryl;

Z' represents a radical selected from the group consisting of



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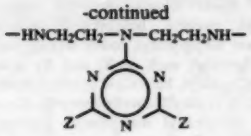

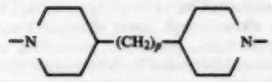

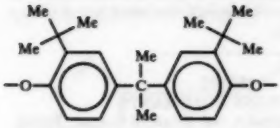

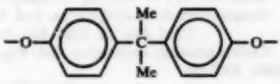

Me = methyl

x represents an integer in the range from 1 to about 50; and, when n=1, Y and M may be the same as X, and,

Z and Z' each includes a terminal functional group selected from H, lower alkyl having from 1 to about 5 carbon atoms, and hydroxyalkyl having from 1 to about 5 carbon atoms.

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**4,480,093**

## AMINES SALTS OF PHOSPHORIC ACID

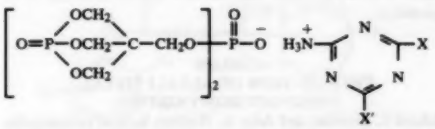
**Yuval Halpern, Skokie, and Donna M. Mott, Des Plaines, both of Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.**

**Filed May 23, 1983, Ser. No. 497,356**

**Int. Cl.³ C07D 251/70, 251/46; C07F 9/65**

**U.S. Cl. 544—195** **3 Claims**

1. An amino-s-triazine salt of a phosphoric acid having the structure:



where X and X' are the same or different hydroxy or amine groups.

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**4,480,094**

## BENZIL KETAL DERIVATIVES

**Tsuneo Hagiwara, Hino, and Akihiro Horike, Musashino, both of Japan, assignors to Teijin Limited, Osaka, Japan**

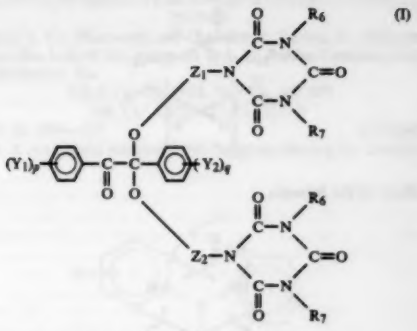
**Division of Ser. No. 118,238, Feb. 4, 1980, Pat. No. 4,400,519. This application May 11, 1982, Ser. No. 376,950**

**Claims priority, application Japan, Feb. 5, 1979, 54/11374**

**Int. Cl.³ C07D 251/32**

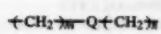
**U.S. Cl. 544—222** **14 Claims**

1. A benzil ketal derivative of the following general formula:

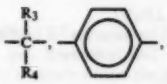


(I)

wherein $Y_1$ and $Y_2$ are identical or different, and each represents a group selected from the class consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 12 carbon atoms, an alkoxy group having 1 to 10 carbon atoms and a halogen atom; p and q, independently of each other, are integers of 1 to 3; $Z_1$ and $Z_2$ are identical or different and represent a group shown by the following formula:

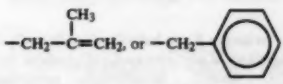


wherein Q represents



—O—, —S—, or a bond, m and n are integers of 1 to 3, and $R_3$ and

$R_4$ represent a hydrogen atom or a methyl group; and $R_6$ and $R_7$ are identical or different and represent a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, —$CH_2$—$CH$=$CH_2$,



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**4,480,095**

## HEXAHYDROPYRIMIDINES AND CORRESPONDING LINEAR POLYAMINES

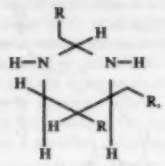
**Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.**

**Filed Dec. 18, 1978, Ser. No. 970,413**

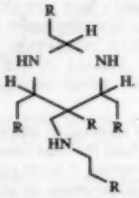
**Int. Cl.³ C07D 239/04**

**U.S. Cl. 544—242** **11 Claims**

1. A composition selected from the group consisting of compounds of the formula



those of the formula



and mixtures thereof, where R is alkyl or aralkyl.

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**4,480,096**

## CHROMOGENIC QUINAZOLINES

**Ian J. Fletcher, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

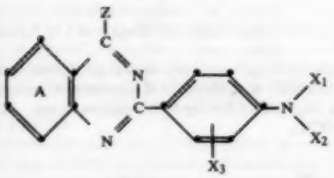
**Filed Jan. 22, 1981, Ser. No. 227,294**

**Claims priority, application Switzerland, Jan. 31, 1980, 780/80; Jul. 15, 1980, 5411/80**

**Int. Cl.³ C07D *239/91***

**U.S. Cl. 544—289** **8 Claims**

1. A compound of the formula



wherein Z is —$OR_1'$ wherein $R_1'$ is halo-$C_2$–$C_6$-alkyl, $C_1$–$C_{12}$-alkyl, cyano-$C_1$–$C_{12}$-alkyl, lower alkoxy-$C_1$–$C_{12}$-alkyl, cyclopentyl, cyclohexyl, phenyl, halophenyl, nitrophenyl, cyanophenyl, lower alkylphenyl, lower alkoxyphenyl, lower alkoxycarbonylphenyl, lower alkylcarbonylphenyl, diphenyl, halodiphenyl, nitrodiphenyl, cyanodiphenyl, lower alkyldiphenyl, lower alkoxydiphenyl, lower alkoxycarbonyldiphenyl, lower alkylcarbonyldiphenyl, naphthyl, halonaphthyl, nitronaphthyl, cyanonaphthyl, lower alkylnaphthyl, lower alkoxynaphthyl, lower alkoxycarbonylnaphthyl, lower alkylcarbonylnaphthyl, benzyl, halobenzyl, nitrobenzyl, cyanobenzyl, lower alkylbenzyl, lower alkoxybenzyl, lower alkoxycarbonylbenzyl, lower alkylcarbonylbenzyl, phenylethyl, halophenylethyl, nitrophenylethyl, cyanophenylethyl, lower alkylphenylethyl, lower alkoxyphenylethyl, lower alkoxy carbonylphenylethyl, lower alkylcarbonylphenylethyl, thienyl, halothienyl, cyanothienyl, nitrothienyl, lower alkylthienyl, lower alkoxythienyl, lower alkoxycarbonylthienyl, furyl, halofuryl, cyanofuryl, nitrofuryl, lower alkylfuryl, lower alkoxyfuryl, lower alkoxycarbonylfuryl, pyrrolyl, halopyrrolyl, cyanopyrrolyl, nitropyrrolyl, lower alkylpyrrolyl, lower alkoxypyrrolyl, lower alkoxycarbonylpyrrolyl, pyrazolyl, halopyrazolyl, cyanopyrazolyl, nitropyrazolyl, lower alkylpyrazolyl, lower alkoxypyrazolyl, lower alkoxycarbonylpyrazolyl, imidazolyl, haloimidazolyl, cyanoimidazolyl, nitroimidazolyl, lower alkylimidazolyl, lower alkoxyimidazolyl, lower alkoxycarbonylimidazolyl, pyridyl, halopyridyl, cyanopyridyl, nitropyridyl, lower alkylpyridyl, lower alkoxypyridyl or lower alkoxycarbonylpyridyl; each of $X_1$ and $X_2$ independently is hydrogen, $C_1$–$C_{12}$-alkyl, halo-$C_1$–$C_{12}$-alkyl, hydroxy-$C_1$–$C_{12}$-alkyl, cyano-$C_1$–$C_{12}$-alkyl, lower alkoxy-$C_1$–$C_{12}$-alkyl, cyclohexyl, phenyl, halophenyl, nitrophenyl, cyanophenyl, lower alkylphenyl, lower alkoxyphenyl, lower alkoxycarbonylphenyl, benzyl, halobenzyl, nitrobenzyl, cyanobenzyl, lower alkylbenzyl, lower alkoxybenzyl, lower alkoxycarbonylbenzyl, or —$NX_1X_2$ is pyrrolidino, piperidino, pipecolino, morpholino, thiomorpholino or piperazino; $X_3$ is hydrogen, halogen, nitro, lower alkyl or lower alkoxy; and ring A is unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy or lower alkoxycarbonyl.

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**4,480,097**

## ISOINDOLINE COLORANTS

**Wolfgang Lotsch, Beindersheim, and Reinhard Kemper, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

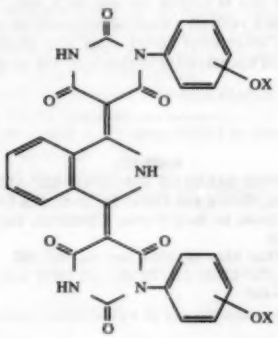
**Filed Jan. 26, 1981, Ser. No. 228,624**

**Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007300**

**Int. Cl.³ C07D *239/36***

**U.S. Cl. 544—296** **3 Claims**

1. An isoindoline colorant of the formula



where X is $C_1$–$C_4$-alkyl and the OX radical is in the 3- or 4-position.

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**4,480,098**

## PREPARATION OF ALKALI METAL THIENO(FURO)PYRIDINES

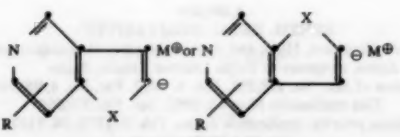
**Richard E. Koehler, and John A. Webber, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Nov. 12, 1982, Ser. No. 441,136**

**Int. Cl.³ C07D *495/04, 491/048***

**U.S. Cl. 546—114** **20 Claims**

1. A process for preparing a compound of the formula

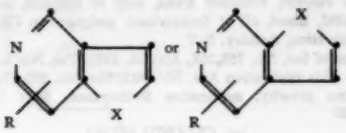


wherein:

R is hydrogen or $C_1$–$C_4$ alkyl;

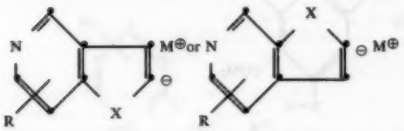
X is O or S; and

$M^{\oplus}$ is an alkali metal cation; comprising reacting a compound of the formula



with a non-nucleophilic alkali metal base in an unreactive solvent at a temperture of about −100 ° to about −30° C.

**18**. A compound of the formula



wherein:

R is hydrogen or $C_1$–$C_4$ alkyl;

X is O or S; and

$M^{\oplus}$is an alkali metal cation.

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**4,480,099**

## DECAHYDROQUINOLYL BENZAMIDES

**Michael S. Hadley, Sawbridgworth, England, assignor to Beecham Group P.L.C., England**

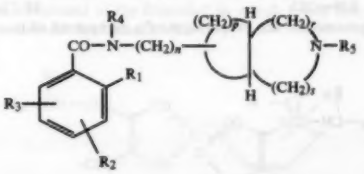
**Filed Jun. 21, 1982, Ser. No. 390,353**

**Claims priority, application United Kingdom, Jun. 22, 1981, 8119186**

**Int. Cl.**[3] **C07D** *215/14, 215/16*

**U.S. Cl. 546—164** **7 Claims**

**1**. A compound of the formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

$R_1$ is a $C_{1-6}$ alkoxy group;

$R_2$ and $R_3$ are the same or different and are hydrogen, halogen, $CF_3$, $C_{1-7}$ alkanoyl, $C_{1-7}$ alkanoylamino, wherein n is 0, nitro, $C_{1-6}$ alkoxy, hydroxy, amino or aminocarbonyl optionally substituted by one or two $C_{1-6}$ alkyl groups;

or $R_1$ and $R_2$ taken together are methylenedioxy or ethylenedioxy in which case $R_3$ is any one of the groups given for $R_1$ and $R_2$ above;

$R_4$ is hydrogen or $C_{1-6}$ alkyl;

$R_5$ is $C_{1-6}$ alkyl;

p is 4,

r is 0, and

s is 3.

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**4,480,100**

## [2-[(NITROPYRIDINYL)AMINO]PHENYL]ARYMETHANONES

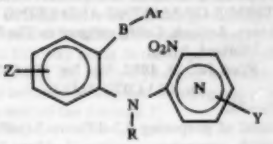
**Young S. Lo, Richmond, and Chandler R. Taylor, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.**

**Filed Sep. 30, 1982, Ser. No. 431,997**

**Int. Cl.**[3] **C07D** *213/61, 213/74*

**U.S. Cl. 546—307** **10 Claims**

**1**. A compound selected from the group having the formula:



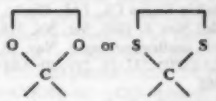
wherein;

R is hydrogen or —alk[1]—Q;

Q is selected from hydrogen, $—NR^1R^2$ or halogen;

alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

B is selected from carbonyl, thioxomethyl;



$R^1$ and $R^2$ are selected from the group consisting of hydrogen, loweralkyl, and —C(O)—O—loweralkyl;

Ar is selected from the group consisting of phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro which may be the same or different;

Y is selected from the group consisting of hydrogen, or 1–2 radicals selected from loweralkyl, hydroxy or loweralkoxy and may be the same or different;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy or nitro or a pharmaceutically acceptable acid addition salt thereof.

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**4,480,101**

## FLUOROALKOXY-AMINOPYRIMIDINES

**Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

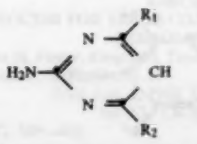
**Filed Jul. 9, 1982, Ser. No. 396,960**

**Claims priority, application Switzerland, Jul. 16, 1981, 4667/81; Aug. 6, 1981, 5075/81; Oct. 13, 1981, 6541/81; Jan. 11, 1982, 124/82; Apr. 8, 1982, 2205/82; Jun. 8, 1982, 3527/82**

**Int. Cl.**[3] **C07D** *239/47*

**U.S. Cl. 544—320** **9 Claims**

**1**. A fluoroalkoxy-aminopyrimidine of the general formula I



(I)

wherein

$R_1$ is halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-haloalk-

oxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_4$-haloalkyl, $—NR_3R_4$ or alkoxy alkyl having at most 4 carbon atoms, and

$R_2$ is a group —G—$CF_2$—T, where G is oxygen or sulfur, T is hydrogen, —CHClF, —CHBrF, —$CHF_2$ or —CH—F—$CF_3$, $R_3$ is hydrogen, methyl or ethyl, and $R_4$ is hydrogen, methyl, ethyl, methoxy, ethoxy or methoxymethyl, with the proviso that $R_1$ is not $C_1$–$C_4$-alkyl when simultaneously E is nitrogen and G is oxygen.

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**4,480,102**

## 2,3-DIFLUORO-5-(TRIFLUOROMETHYL)PYRIDINE AND METHODS OF MAKING AND USING THE SAME

**John A. Werner, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Jul. 23, 1982, Ser. No. 401,057**

**Int. Cl.³ C07D *213/26***

**U.S. Cl. 546—345** **10 Claims**

1. A method of preparing 2,3-difluoro-5-(trifluoromethyl)-pyridine which comprises reacting 3-chloro-2-fluoro-5-(trifluoromethyl)pyridine with CsF in the presence of a solvent at a temperature greater than about 85° C.

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**4,480,103**

## 4-FLUORO-5-OXYPYRAZOLE DERIVATIVES

**Nobuo Ishikawa, Yokohama, and Tomoya Kitazume, Tokyo, both of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo and Daikin Kogyo Co., Ltd., Osaka, both of, Japan**

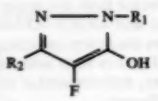
**Filed Nov. 5, 1981, Ser. No. 318,366**

**Claims priority, application Japan, Nov. 13, 1980, 55-160136**

**Int. Cl.³ C07D *231/16, 231/20*; A01N *43/56***

**U.S. Cl. 548—365** **4 Claims**

1. 4-Fluoro-5-oxypyrazole derivative having the formula



wherein $R_1$ represents hydrogen or a lower alkyl group; and $R_2$ represents a phenyl group, or a phenyl group having one or more substituents selected from fluorine, chlorine, a lower alkyl group and a dimethylamino group.

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**4,480,104**

## HYDROQUINONE DERIVATIVES AND THEIR USE IN PHOTOGRAPHIC MATERIALS

**Stephen R. Postle, Brentwood, and Patrick D. P. Thomas, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland**

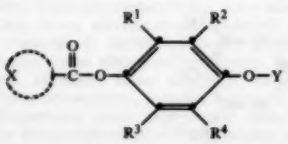
**Division of Ser. No. 306,847, Sep. 29, 1981, Pat. No. 4,410,702. This application May 15, 1983, Ser. No. 466,695**

**Claims priority, application United Kingdom, Oct. 2, 1980, 8031835**

**Int. Cl.³ C07D *307/68, 333/40***

**U.S. Cl. 549—71** **1 Claim**

1. A substituted hydroquinone compound of the formula



(I)

wherein $R^1$, $R^2$, $R^3$ and $R^4$ are each hydrogen, X completes a 2-thienyl or 2-furyl ring, and Y is hydrogen.

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**4,480,105**

## 3,5-DISUBSTITUTED PHTHALIC ACIDS AND PHTHALIC ANHYDRIDES

**Walter Fischer; Vratislav Kvita, both of Reinach, and Hans Zweifel, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

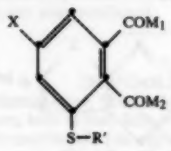
**Division of Ser. No. 258,268, Apr. 28, 1981, Pat. No. 4,363,917. This application Apr. 30, 1982, Ser. No. 373,573**

**Claims priority, application Switzerland, May 6, 1980, 3518/80**

**Int. Cl.³ C07D *307/89***

**U.S. Cl. 549—243** **4 Claims**

1. A Compound of the formula II



(II)

in which $M_1$ and $M_2$ together are —O—, X is $—NO_2$, —OR′, —SR′ or $—SO_2R'$ and the (R′)s independently of one another are $C_{1-20}$-alkyl, $C_{3-5}$-alkenyl, $C_{3-5}$-alkynyl, $C_{2-4}$-monohydroxyalkyl, $C_{1-12}$-halogenoalkyl, benzyl, $C_{5-12}$-cycloalkyl, phenyl, carboxyphenyl, halogenophenyl, nitrophenyl, alkyl- or alkoxy-phenyl each having 1–4 C atoms in the alkyl or alkoxy moieties. or acetylaminophenyl.

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**4,480,106**

## PROCESS FOR THE PREPARATION OF ASYMMETRICALLY SUBSTITUTED MALEIC ANHYDRIDES, AND ASYMMETRICALLY SUBSTITUTED MALEIC ANHYDRIDES

**Werner Breitenstein; Marcus Baumann, and Hans Bosshard, all of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

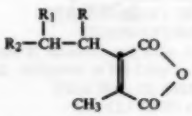
**Filed Oct. 21, 1982, Ser. No. 435,593**

**Claims priority, application Switzerland, Oct. 28, 1981, 6880/81**

**Int. Cl.³ C07D *307/60***

**U.S. Cl. 549—253** **18 Claims**

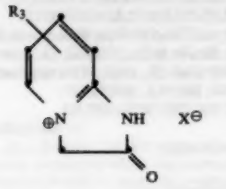
1. A process for the preparation of a compound of the formula I



(I)

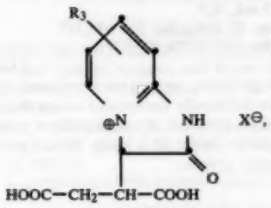
in which R is hydrogen, $C_{1-7}$-alkyl or phenyl which is unsubstituted or substituted by halogen, methoxy or $C_{1-4}$-alkyl, $R_1$ is hydrogen, $C_{1-7}$-alkyl, cyclopentyl, cyclohexyl or phenyl which is unsubstituted or substituted by halogen, methoxy or $C_{1-4}$-alkyl, or R and $R_1$ together are $—(CH_2)_3—$ or $—(CH_2)_4—$, and $R_2$ is —CO—$C_{1-8}$-alkyl, —CN, —COO—$C_{1-4}$-alkyl, —COO—allyl, —COOH or —CO—phenyl which can be substituted by $C_{1-4}$-alkyl or in which $R_1$ is hydrogen and R and $R_2$ together are $—(CH_2)_3—CO—$, the carbonyl group in the ring formed in this way being in the m-position relative to the —CH—group which is attached to R, which comprises

(a) in the case where R=H, firstly treating a compound of the formula II



(II)

with fumaric acid, maleic acid or maleic anhydride, in the presence of a base, and then converting the product to a compound of the formula III

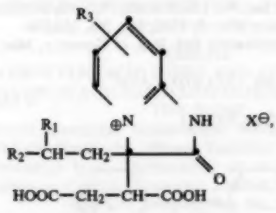


(III)

in the presence of a strong acid, reacting the compound of the formula III with a compound of the formula IVa

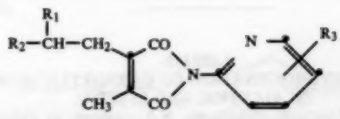
(IVa)

to give a compound of the formla V



(V)

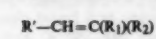
converting the compound of the formula V to a mixture of a compound of the formula I in which R=H and a compound of the formula VIa



(VIa)

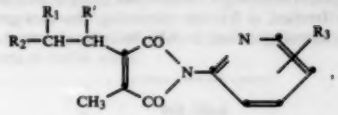
by heating to temperatures of between 80° and 160° C., and hydrolyzing the compound of the formula VIa with aqueous acid to give a compound of the formula I in which R=H, or

(b) in the case where R is not H, firstly treating a compound of the formula II with a compound of the formula IVb



(IVb),

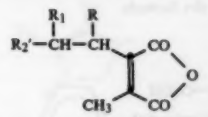
in the presence of a base, and then reacting the product with fumaric acid, maleic acid or maleic anhydride, at temperatures of between 80° and 160° C., to give a mixture of a compound of the formula I in which R is not H and a compound of the formula VIb



(VIb)

and hydrolyzing the compound of the formula VIb with aqueous acid to give a compound of the formula I in which R is not H, R, $R_1$ and $R_2$ being as defined in the formula I, R′ having the same definition as R, but not being H, or, together with $R_2$, being $-(CH_2)_3-CO-$, in the case where $R_1$=H, the carbonyl group in the ring formed in this way being in the m-position relative to the —CH— group, $R_3$ being hydrogen or methyl and $X^{\ominus}$ being the anion of an organic or inorgamic acid.

8. A compound of the formula I′



(I′)

in which R is hydrogen, $C_{1-7}$-alkyl or phenyl which is unsubstituted or substituted by halogen, methoxy or $C_{1-4}$-alkyl, $R_1$ is hydrogen, $C_{1-7}$-alkyl, cyclopentyl, cyclohexyl or phenyl which is unsubstituted or substituted by halogen, methoxy or $C_{1-4}$-alkyl, or R and $R_1$ together are $-(CH_2)_3-$ or $-(CH_2)_4-$, and $R_2'$ is —CO—$C_{1-8}$-alkyl, —CN, —COO—$C_{1-4}$-alkyl, —COO—allyl, —COOH or —CO—phenyl which can be substituted by $C_{1-4}$-alkyl but $R_2'$ is not —COOH if R and $R_1$ are hydrogen, or in which $R_1$ is hydrogen and R and $R_2'$ together are $-(CH_2)_3-CO-$, the carbonyl group in the ring formed in this way being in the m-position relative to the —CH— group which is attached to R.

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**4,480,107**

## PYRANIC DERIVATIVES USEFUL AS INTERMEDIATES IN MAKING MUSCONE

**Karl H. Schulte-Elte, Onex/Ge; Joseph J. Becker, and Walter Schenk, both of Geneva, all of Switzerland, assignors to Firmenich SA, Switzerland**

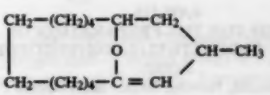
**Division of Ser. No. 183,722, Sep. 3, 1980, Pat. No. 4,335,262. This application Nov. 20, 1981, Ser. No. 323,578**

**Claims priority, application Switzerland, Sep. 13, 1979, 8293/79**

**Int. Cl.³ C07D *313/00***

**U.S. Cl. 549—355** **1 Claim**

1. A pyranic derivative of formula



(Ia)

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**4,480,108**

## PROCESS FOR SEPARATION OF TOCOPHEROL HOMOLOGUES

**Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 1, 1983, Ser. No. 519,477**

**Int. Cl.³ C07D *311/72***

**U.S. Cl. 549—413** **6 Claims**

1. A process for separating the tocopherol homologues which comprises reacting the acylated tocopherol mixture with at least one non-aromatic saturated cyclic amine to deacy-

late one group of tocopheryl esters thereby enabling separation of the tocopherol homologue mixture into an alpha tocopherol homologue fraction, a fraction containing the beta-gamma tocopherol homologues and a delta tocopherol homologue fraction.

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4,480,109

## PROCESS FOR PRODUCING THREO-3-(3,4-DIHYDROXYPHENYL)SERINE

Naohito Ohashi, Nishinomiya; Shoji Nagata, and Kikuo Ishizumi, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 3, 1983, Ser. No. 455,254

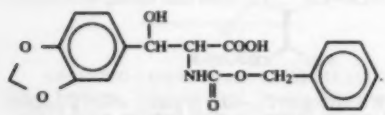
Claims priority, application Japan, Jan. 14, 1982, 57-4501; Apr. 20, 1982, 57-66491; Apr. 21, 1982, 57-67963; Jun. 9, 1982, 57-99786

Int. Cl.³ C07C *19/00, 20/00;* C07D *317/54, 317/58*

U.S. Cl. 549—441 13 Claims

11. Threo-N-Carbobenzoxy-3-(3,4-methylenedioxyphenyl)serine represented by the formula

[3"]



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4,480,110

## PROCESS FOR THE PREPARATION OF URETHANES

Peter Heitkämper, Dormagen; Rudolf Fauss, Cologne; Kurt Findeisen, Odenthal; Stefan Penninger, Dormagen, and Hans-Joachim Scholl, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 197,041, Oct. 15, 1980,. This application Jan. 9, 1984, Ser. No. 569,533

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943550

Int. Cl.³ C07C *125/06*

U.S. Cl. 549—467 5 Claims

1. A process for the preparation of N,O-disubstituted urethanes by reacting (a) substituted ureas with (b) alcohols at temperatures of from 120° to 350° C., characterized in that (c) N-unsubstituted urethanes and/or (d) urea and/or polyurets are used as further reactants in a quantity of at least 10% by weight, based on the quantity of substituted urea and the reaction is carried out in the presence of no more than 5% by weight, based on the sum of starting materials, of esterification catalysts for carboxylic acids.

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4,480,111

## PROCESS FOR THE PREPARATION OF 4-HYDROXY-2,5-DIMETHYL-2,3-DIHYDROFURAN-3-ONE

George M. Whitesides, Newton, Mass., and Francois P. Mazenod, Geneva, Switzerland, assignors to Firmenich SA, Switzerland

Filed Feb. 18, 1983, Ser. No. 467,821

Claims priority, application Switzerland, Mar. 26, 1982, 1869/82

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—477 9 Claims

1. A process for the preparation of 4-hydroxy-2,5-dimethyl-2,3-dihydrofuran-3-one, which comprises subjecting an alkali- or an alkaline earth metal derivative of fructose-1,6-diphosphate or fructose-1- or fructose-6-monophosphate, or one of their precursors, to hydrogenolysis in a basic medium in the presence of a metal catalyst.

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4,480,112

## METHOD AND INTERMEDIATES FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE

Hugh L. Dryden, Deerfield, and John B. Hill, Woodstock, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 506,465, Jun. 20, 1983,. This application Feb. 16, 1984, Ser. No. 580,912

Int. Cl.³ C07C *101/20;* C07D *307/60*

U.S. Cl. 549—478 2 Claims

1. N-acetoacetyl-L-aspartic acid.

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4,480,113

## EPOXIDATION CATALYST AND PROCESS

William F. Brill, Skillman, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,787

Int. Cl.³ C07D *301/12*

U.S. Cl. 549—531 2 Claims

1. The method of preparing an oxirane compound which comprises reacting an olefinically unsaturated compound with hydrogen peroxide in the presence of a solid catalyst comprising tellurium chemically bound to a cross linked polymer which contains aromatic groups.

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4,480,114

## 2-(4-BIPHENYLYL)-2-(HALOPHENYL)-OXIRANE COMPOUNDS

Erik Regel, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

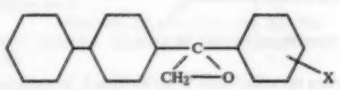
Continuation of Ser. No. 179,623, Aug. 20, 1980, abandoned, which is a division of Ser. No. 128,213, Mar. 7, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,086

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1979, 2912282

Int. Cl.³ C07D *303/08*

U.S. Cl. 549—563 3 Claims

1. A compound of the formula



wherein X is halogen.

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4,480,115

## DIRECT HYDROGENATION OF CARBOXYLIC ACIDS TO ALCOHOL AND ESTERS

James L. McGinnis, Middlesex, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 17, 1983, Ser. No. 476,310

Int. Cl.³ C07C *67/00, 29/136*

U.S. Cl. 560—1 14 Claims

1. A process for direct hydrogenation of a carboxylic acid to the corresponding alcohol and formation of a corresponding ester which consists essentially of reacting a $C_2$–$C_{30}$ carboxylic acid with hydrogen and carbon monoxide in a liquid phase medium at a temperature between about 100°–350° C. and a pressure between about 200–10,000 psi in the presence of a soluble catalyst comprising a ruthenium compound and a Lewis Acid metal halide or boron halide to yield a product comprising an ester of the carboxylic acid and its corresponding alcohol

**4,480,116**

## PROCESS INHIBITOR FOR READILY POLYMERIZABLE ACRYLATE MONOMER

**Ambrose J. Clonce; Michael Palmer, both of Kingsport, and Samuel L. Gott, Mt. Carmel, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 2, 1983, Ser. No. 471,384**

**Int. Cl.³ C07C *67/62, 51/50***

**U.S. Cl. 560—4** **12 Claims**

1. In a process for the preparation of readily polymerizable acrylate monomer which includes a distillation step at elevated temperature and/or reduced pressure, the improvement which comprises providing a process polymerization inhibitor comprising phenyl-para-benzoquinone, 2,5-diphenyl-para-benzoquinone, or a mixture thereof, said process polymerization inhibitor being present in a concentration of about 50 to 3000 ppm.

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**4,480,117**

## NEMATIC LIQUID CRYSTALLINE COMPOUNDS

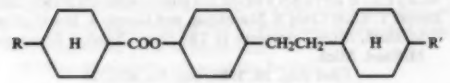
**Haruyoshi Takatsu, Kodaira, and Hisato Sato, Tokyo, both of Japan, assignors to Dainippin InK and Chemicals, Inc., Tokyo, Japan**

**Filed May 18, 1983, Ser. No. 495,826**

**Int. Cl.³ C09K *3/34*; C07C *69/75*; G02F *1/13***

**U.S. Cl. 560—1** **1 Claim**

1. A compound of the general formula




wherein R and R' each represent a linear alkyl group having 1 to 9 carbon atoms, and the two cyclohexane rings are arranged in a trans(equatorial-equatorial) form.

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**4,480,118**

## CARBOXYLIC ACID ESTER AND AN INSECTICIDAL AND/OR ACARICIDAL COMPOSITION CONTAINING THE SAME

**Kazunori Tsushima, Nishinomiya; Noritada Matsuo, Itami; Makoto Hatakoshi, Minoo; Toshihiko Yano, Ikoma, and Nobushige Itaya, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

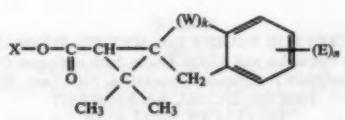
**Filed Dec. 30, 1981, Ser. No. 335,618**

**Claims priority, application Japan, Jan. 13, 1981, 56-4066; Apr. 7, 1981, 56-52628; May 20, 1981, 56-77018**

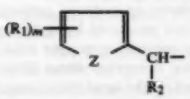
**Int. Cl.³ C07L *69/76***

**U.S. Cl. 560—8** **35 Claims**

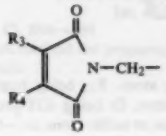
1. A carboxylic acid ester represented by the general formula,



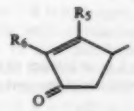

wherein X is represented by the formula,



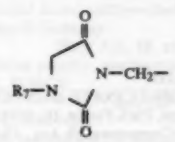

$R_1$ being hydrogen or halogen atom, or methyl, 2-propenyl, 2-propynyl, benzyl, 2-cyclopenten-1-yl, thienyloxy or thenyl group, $R_2$ being hydrogen atom, or ethynyl, cyano or 1-propynyl group, Z being oxygen or sulfur atom, or —CH=CH— group and m being an integer of 1 to 3 when Z is oxygen or sulfur atom and being an integer of 1 to 5 when Z is —CH=CH— group; provided that when $R_1$ is benzyl group, Z is oxygen or sulfur atom;



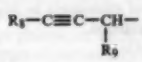

$R_3$ and $R_4$ being methyl group or bonded at the ends to form tetramethylene chain;



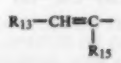

$R_5$ being hydrogen atom or methyl group and $R_6$ being benzyl, 1-buten-3-yl or 1-butyn-3-yl group when $R_5$ is hydrogen atom and $R_6$ being ethyl, 2-propenyl, 3-chloro-2-propenyl or 2-propynyl group when $R_5$ is methyl group;



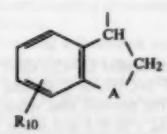

$R_7$ being 2-propenyl or 2-propynyl group;



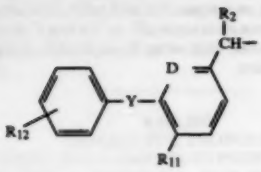

$R_8$ being hydrogen atom or methyl group and $R_9$ being a group of the formula,




($R_{13}$ is $C_{1-3}$ alkyl, 2-propenyl, 2-propynyl or benzyl group and $R_{15}$ is hydrogen atom or methyl group) or $R_{14}$—C≡C— ($R_{14}$ is hydrogen atom or $C_{1-3}$ alkyl, 2-propenyl, 2-propynyl or benzyl group);

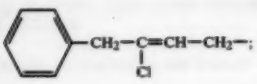



$R_{10}$ being hydrogen or halogen atom, or methyl or 2-propenyl group and A being oxygen atom or methylene group;



(VIII)

$R_{11}$ being hydrogen or fluorine atom, $R_{12}$ being hydrogen, chlorine, fluorine or bromine atom, D being CH group or nitrogen atom, and Y being oxygen or sulfur atom, or $—CH_2—$ or —NH— group, and $R_2$ being as defined above; or



(IX)

W is oxygen atom or $—CH_2—$ group; k is an integer of 0 or 1; E is hydrogen, chlorine, fluorine or bromine atom; and n is an integer of 1 to 4.

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**4,480,119**

## UNSYMMETRICAL SULFOSUCCINATE DIESTERS

**Kermit D. Longley, 305 Winnebago, Park Forest, Ill. 60466, and Anastasios J. Karalis, 2300 N. Commonwealth Ave., Chicago, Ill. 60614**

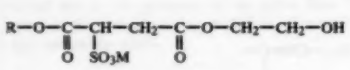
**Continuation-in-part of Ser. No. 842,199, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 535,764, Dec. 23, 1974, abandoned. This application Jun. 18, 1979, Ser. No. 49,384**

**The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.**

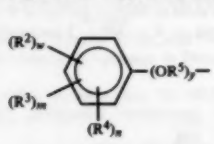
**Int. Cl.³ C07C *143/12***

**U.S. Cl. 560—151** **7 Claims**

1. An unsymmetrical sulfosuccinate surfactant according to the formula



where R is a $C_6$–$C_{20}$ alkyl or a radical of an ethoxylated or propoxylated alkyl phenol having the following formula:



where $R^2$ and $R^3$ are the same or dissimilar $C_5$–$C_{12}$ alkyl radicals, $R^4$ is a $C_1$–$C_3$ alkyl radical, $R^5$ is $C_2H_4$ or $C_3H_6$ and each of w, m, and n is zero to 1, with the proviso that when w is zero, m is 1 or 2; when $R^5$ is $C_3H_6$, y is 1–4 and when $R^5$ is $C_2H_4$, y is 1 to 12; M is a cation selected from the group of alkali metals, alkaline earth metals, and water soluble organic amines.

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**4,480,120**

## PROCESS FOR THE PREPARATION OF ALKYL-2-ALKOXYIMINO-3-OXO-4-CHLOROBUTYRATES

**Linda M. Jewell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 24, 1983, Ser. No. 478,588**

**Int. Cl.³ C07C *131/00, 131/02***

**U.S. Cl. 560—168** **16 Claims**

1. Process for the preparation of an alkyl-2-alkoxyimino-3-oxo-4-chlorobutyrate which comprises treating an alkyl-2-alkoxyimino-3-oxobutyrate with sulfuryl chloride in the presence of a catalytic amount of a N,N-dialkyl substituted carboxamide, wherein the alkyl moiety of the above alkoxyimino reactant and product is a branched or straight chain saturated aliphatic hydrocarbon having 1–6 carbon atoms and the alkyl portion of the alkoxy moiety of said reactant and product is a branched or straight chain saturated aliphatic hydrocarbon having 1–6 carbon atoms or a saturated cycloaliphatic hydrocarbon having 3–6 carbon atoms.

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**4,480,121**

## PREPARATION OF 2-HALO-1-ALKENES AND ACRYLATE ESTERS FROM HYDROCARBON STREAMS

**Robert T. Klun; Craig B. Murchison, and Dennis A. Hucul, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 26, 1982, Ser. No. 411,726**

**Int. Cl.³ C07C *67/36, 17/08***

**U.S. Cl. 560—206** **14 Claims**

1. A process for preparing a 2-halo-1-alkene comprising contacting a hydrocarbon stream with a hydrogen halide, in the presence of water and an effective amount of a catalyst, at a temperature between about 100° C. and about 400° C., wherein; the hydrocarbon stream comprises a 1,2-diene, a terminal acetylene or mixtures thereof, represented by the formulas $CH_2=C=CH—R$ or $CH\equiv C—CH_2—R$ wherein R is hydrogen, alkyl, cycloalkyl or aryl and may be substituted or unsubstituted; the water is present in an amount capable of maintaining the selectivity of the catalyst for the insertion of the halide on the 2 carbon of the 1,2-diene or terminal acetylene; and the catalyst comprises carbon, silica alumina, aluminosilicates, silica gel, silica, silica magnesia, silicalite, group IIIA, IIIB, IVA, IVB or V metal oxides or rare earth oxides.

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**4,480,122**

## PROCESS FOR PRODUCING METHYL FORMATE

**Theodore Horlenko, and Adolfo Aguilo, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.**

**Filed Sep. 27, 1982, Ser. No. 423,977**

**Int. Cl.³ C07C *67/40, 69/06***

**U.S. Cl. 560—239** **7 Claims**

1. A process for producing methyl formate by the vapor phase dehydrogenation of methanol at temperatures of at least about 235° C. and at atmospheric or reduced pressures, by passing methanol over a catalyst produced by reducing with hydrogen a catalyst precursor comprising copper oxide in an amount such that said precursor comprises about 10 to about 80 weight percent copper based on the total metal atoms present, with the balance essentially a spinel structure support comprising the oxides of zinc and aluminum, said precursor being characterized by the presence of spinel in crystallites no greater than 120 Angstrom units.

4,480,123

## PREPARATION OF DIACYLOXYALKADIENES

Rolf Fischer, Heidelberg, and Hans-Martin Weitz, Bad Dürkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

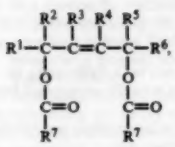
Division of Ser. No. 330,091, Dec. 14, 1981,. This application Jul. 25, 1983, Ser. No. 516,979

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101002

Int. Cl.³ C07C *67/055*

U.S. Cl. 560—244 13 Claims

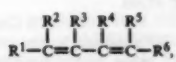
1. A process for the preparation of a diacyloxyalkadiene of the formula



I

where $R^1$ to $R^5$ are each hydrogen or a hydrocarbon radical of 1 to 6 carbon atoms, $R^6$ is hydrogen or a hydrocarbon radical of 3 to 9 carbon atoms having one or more non-conjugated double bonds, and $R^7$ is hydrogen or alkyl of 1 to 5 carbon atoms, and in the case in which $R^6$ is hydrogen, one or more of $R^1$ to $R^5$ are $R^8$—$CH_2$— where $R^8$ is a hydrocarbon radical of 2 to 5 carbon atoms having one or more non-conjugated double bonds, which process comprises:

reacting an aliphatic triene of the formula



II

where $R^1$ to $R^6$ have the meanings given above, with a carboxylic acid of the formula

$$R^7\text{—COOH} \qquad \text{III,}$$

where $R^7$ has the meaning given above, and with oxygen at an elevated temperature in the presence of a catalyst which contains palladium, platinum or salts of these metals.

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4,480,124

## PROCESS FOR THE PURIFYING OF POLYTETRAMETHYLENE ETHER GLYCOL OR CORRESPONDING DIESTER

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 356,963

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112065

Int. Cl.³ C07C *67/48, 41/34, 41/44*

U.S. Cl. 560—248 3 Claims

1. A process for purifying polytetramethylene ether glycol or its corresponding diester prepared by the cationic polymerization of tetrahydrofuran comprising treating said polytetramethylene ether glycol or diester with hydrogen in the presence of a hydrogenation catalyst.

4,480,125

## ITACONAMIDE COMPOUNDS AND METHOD OF PREPARATION

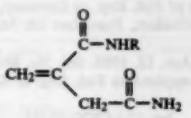
Howard C. Haas, Arlington; Stanley J. Jasne, Andover, both of Mass., and Robert D. Moreau, Nashua, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 16, 1981, Ser. No. 322,066

Int. Cl.³ C07C *102/00*

U.S. Cl. 564—144 9 Claims

1. A method for preparing an itaconamide compound of the formula



wherein R is hydrogen, alkyl, aryl, alkaryl, or aralkyl comprising the steps of reacting 2-methylenesuccinamic acid with an alkyl or aryl haloformate in an aprotic organic solvent to provide the corresponding mixed anhydride and reacting said mixed anhydride with a compound of the formula $RNH_2$, wherein R is hydrogen, alkyl, aryl, alkaryl, or aralkyl, to provide the corresponding itaconamide compound.

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4,480,126

## PROCESS FOR THE PREPARATION OF QUATERNARY AMMONIUM COMPOUNDS

Horst Rutzen, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,759

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136628

Int. Cl.³ C07C *91/40*

U.S. Cl. 564—292 9 Claims

1. A process for the preparation of a quaternary ammonium compound comprising reacting together a tertiary amine and a vicinal halohydrin at a temperature in the range of from about 40° C. to about 100° C. in an aqueous system under normal atmospheric pressure, wherein the constituents on the tertiary amine consist essentially of one or more alkyl, hydroxyalkyl, or aralkyl groups, or an N-heterocyclic group having the nitrogen atom of the tertiary amine in the ring structure, wherein such groups each contain less than 10 carbon atoms, and wherein the halohydrin is a 1,2 halohydrin containing from 6 to 28 carbon atoms.

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4,480,127

## PROCESS FOR THE PRODUCTION OF VARIABLE AMOUNTS OF DPA AND ANILINE USING ONLY PHENOL AND AMMONIA AS THE FEEDSTOCK

Mitchell Becker, Teaneck, N.J., and Howard M. Sachs, Riverdale, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed May 20, 1983, Ser. No. 496,371

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—402 10 Claims

1. A process for the formation of diphenylamine and aniline in amounts ranging from about 100:0 to 1:99 wt % DPA:aniline comprising:

contacting a feedstock consisting essentially of phenol and ammonia in a reaction zone with a solid, heterogeneous acidic alumina catalyst and reacting to form aniline in situ, so as to form a mixture in amounts ranging from about 20:1 to 1:100 molar % of phenol plus aniline:ammonia;

reacting the formed in situ aniline in the presence of the solid heterogeneous acidic alumina catalyst with either phenol or a second aniline in the phenol-ammonia-aniline mixture present in the reaction zone to form diphenylamine;

separating the formed diphenylamine and a predetermined amount of aniline as reaction products from the reaction zone mixture;

recycling the remaining phenol-ammonia-aniline stream back to the reaction zone;

continuing the above cycle.

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**4,480,128**

**PROCESS FOR THE MANUFACTURE OF O-TOLUIDINE AND/OR M-TOLUIDINE AND/OR P-TOLUIDINE**

**Hans-Jürgen Arpe, Frankfurt am Main, and Heinz Litterer, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Apr. 12, 1983, Ser. No. 484,179**

**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213876**

**Int. Cl.³ C07C *85/26***

**U.S. Cl. 564—424** **12 Claims**

1. A process for the manufacture of at least one member selected from the group consisting of o-toluidine m-toluidine and p-toluidine, which comprises

(a) treating, at a temperature of from 250° to 500° C., a first charge containing at least one toluidine isomer other than a toluidine isomer sought to be isolated, with an isomerization catalyst selected from the group of synthetic zeolites of the pentasil type, the ions of which are exchanged, to form a second charge,

(b) isolating the desired toluidine isomer from the second charge by selective adsorption to an X or Y zeolite, the ions of which are exchanged, and subsequent desorption, and

(c) recycling the balance of the second charge to step (a).

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**4,480,129**

**PROCESS FOR SEPARATING ISOMERS OF TOLUIDINE**

**James W. Priegnitz, Elgin, and Hermann A. Zinnen, Evanston, both of Ill., assignors to UOP Inc., Des Plaines, Ill.**

**Filed Sep. 29, 1983, Ser. No. 537,123**

**Int. Cl.³ C07C *85/26***

**U.S. Cl. 564—424** **6 Claims**

1. A process for separating p-toluidine by adsorption of said p-toluidine in the pores of a hereinafter characterized X or Y-type zeolite from a feed mixture comprising p-toluidine and o-toluidine or m-toluidine said process comprising contacting said mixture with an adsorbent comprising an X or Y-type zeolite having cations exchanged with a cation selected from the group consisting of Fe, Mn, Co, Ni and Zn at conditions of from about 20° C. to about 200° C. and a pressure sufficient to maintain said liquid phase to selectively adsorb said p-toluidine while said o-toluidine or m-toluidine are removed from said adsorbent, and thereafter contacting said X or Y-type zeolite containing said p-toluidine with a desorbent, at desorption conditions, to remove said adsorbed p-toluidine derived from said feed mixture, said desorbent material comprising aniline or an alkyl amine, excluding alkylamines having eight or more carbon atoms per molecule when said adsorbent comprises an X-type zeolite.

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**4,480,130**

**PREPARATION OF ORTHO-(ALKYLTHIOMETHYL) ANILINES BY CATALYTIC SULFILIMINE REARRANGEMENT**

**Audrey Y. Ku, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Sep. 7, 1983, Ser. No. 529,914**

**Int. Cl.³ C07C *85/00***

**U.S. Cl. 564—440** **11 Claims**

1. A process for catalytically rearranging aromatic sulfilimines to the corresponding ortho-(alkylthiomethyl)aniline, which process comprises heating an aromatic sulfilimine in an inert organic solvent, in the presence of a minor amount of catalyst selected from the group consisting of:

and

wherein

$R_1$ *can be a hydrogen, a lower alkyl or an —NH— alkyl and R2* can be a hyrogen, a lower alkyl, aryl or a

provided that $R_1$ and $R_2$ are not both hydrogens, or

$R_1$ and $R_2$ can be joined to form a cyclic compound having up to a 7-member ring, and

$R_3$ and $R_4$ can be a hydrogen, or a lower alkyl; provided that $R_3$ and $R_4$ are not both hyrogens, or

$R_3$ and $R_4$ can be joined to form a cyclic compound having up to a 7-member ring.

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**4,480,131**

**PROCESS FOR SELECTIVE PRODUCTION OF DI- AND TRI-ALKYLAMINES**

**Kamil Klier, Bethlehem; Richard G. Herman, Whitehall, and Gamini A. Vedage, Bethlehem, all of Pa., assignors to Lehigh University, Bethlehem, Pa.**

**Filed Jun. 1, 1983, Ser. No. 500,037**

**Int. Cl.³ C07C *85/06***

**U.S. Cl. 564—480** **9 Claims**

1. A selective alkylation process for preparing higher substituted amines by reacting a primary amine with a straight or branched chain alcohol having up to twelve carbon atoms under mild reaction conditions, comprising one to 100 atmospheres and 50° to 250° C., wherein the amine to alcohol reactant ratio, expressed on a molar basis, ranges from approximately 0.5:1 to about 20:1, in the presence of a catalyst system selected from the group consisting of (a) a binary combination of essentially amorphous finely divided metallic copper dispersed in zinc oxide and (b) a deacidified copper or palladium combination with at least one additional metal oxide compound selected from the group of zinc oxide, alumina, and chromium oxide.

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**4,480,132**

**PROCESS FOR THE PREPARATION OF $\alpha,\beta$-UNSATURATED KETONES**

**William T. Brown, Johnson City, and Robert M. Simons, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 21, 1983, Ser. No. 553,930**

**Int. Cl.³ C07C *45/60***

**U.S. Cl. 568—42** **7 Claims**

1. Process for the preparation of a 2-oxopropylidene compound which comprises reacting an aldehyde with a 2,2-dialkyl-4-methyl-6-keto-1,3-dioxene in the presence of a catalytic amount of a halide of aluminum, cobalt, iron, manganese, nickel, tin, titanium or zinc.

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**4,480,133**

**CHEMICAL PROCESS**

**Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Mar. 4, 1983, Ser. No. 472,196**

**Int. Cl.³ C07C *45/45***

**U.S. Cl. 568—362** **20 Claims**

1. A process for the preparation of 2,4-dihydrocarbyl-

spiro[5.5]undeca-1,4,8-trien-3-one compounds which comprises reacting an N,N-dihydrocarbyl,2,6-dihydrocarbyl-4-aminomethylphenol with a conjugated diene and an alkyl halide in a liquid solvent medium.

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**4,480,134**

## PROCESS FOR PREPARING PHENOL AND ACETONE FROM CUMENE

**John W. Fulmer, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.**

**Filed Apr. 5, 1983, Ser. No. 482,298**
**Int. Cl.³ C07C *45/53***
**U.S. Cl. 568—385** **8 Claims**

1. In a process for oxidatively preparing phenol and acetone from cumene including the steps of

a. cleaving cumene hydroperoxide to produce a mixture comprising phenol, acetone and side products including heavy residue;
b. separating acetone from phenol and heavy residue;
c. separating the heavy residue from the phenol;
d. treating the said heavy residue at elevated temperature;
e. separating lighter boiling material from heavier boiling material of the residue, said lighter boiling material comprising cumene, α-methylstyrene, and phenol;

the improvement comprising

f. separating the said lighter boiling material into two fractions, the lighter fraction comprising the bulk of the benzene and toluene, the heavier fraction comprising the bulk of the phenol, cumene and α-methylstyrene; and
g. not recycling into the process streams any significant portion of the said lighter fraction.

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**4,480,135**

## PROCESS FOR OXIDIZING ALCOHOLS TO ALDEHYDES AND/OR KETONES

**Antonio Esposito; Carlo Neri, and Franco Buonomo, all of S. Donato Milanese, Italy, assignors to Anic S.p.A., Palermo, Italy**

**Filed Jul. 14, 1983, Ser. No. 513,801**
**Claims priority, application Italy, Jul. 28, 1982, 22607 A/82**
**Int. Cl.³ C07C *45/29***
**U.S. Cl. 568—385** **10 Claims**

1. A process for oxidising primary and/or secondary alcohols to the corresponding aldehyde and/or ketone derivatives, characterised by reacting said alcohols with an aqueous solution of hydrogen peroxide in the presence of synthetic zeolites containing titanium atoms, of the following general formula:

$$xTiO_2.(1-x)SiO_2$$

where x lies between 0.0001 and 0.04, and possibly in the presence of one or more solvents.

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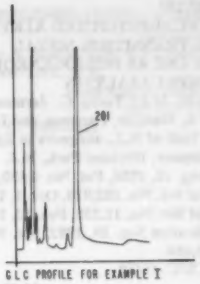
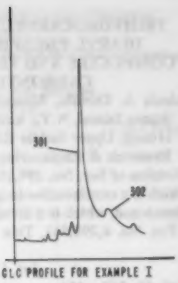
**4,480,136**

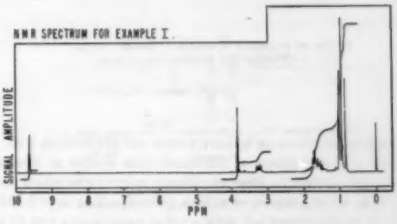
## NORBORNYL OXYACETALDEHYDE, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

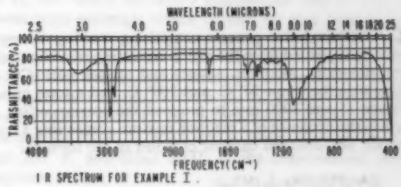
**Robert P. Belko, Woodbridge; Richard M. Boden, Ocean, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

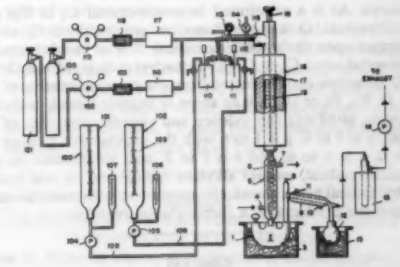
**Continuation-in-part of Ser. No. 357,157, Mar. 11, 1982, , which is a division of Ser. No. 303,012, Sep. 17, 1981, Pat. No. 4,354,043. This application Jan. 10, 1983, Ser. No. 456,984**
**Int. Cl.³ C07C *47/115***
**U.S. Cl. 568—445** **1 Claim**



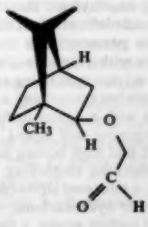



1. The norbornyl oxyacetaldehyde having the structure:



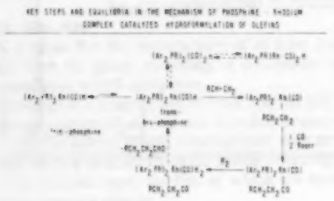
## 4,480,137
## TRIHYDROCARBYL SILYL SUBSTITUTED ALKYL DIARYL PHOSPHINE TRANSITION METAL COMPLEXES AND THEIR USE AS HOMOGENEOUS CARBONYLATION CATALYSTS

**Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermansen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-Der Huang, Upper Saddle River, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.**

**Division of Ser. No. 295,193, Aug. 21, 1984, Pat. No. 4,450,299, which is a continuation-in-part of Ser. No. 192,810, Oct. 1, 1980, abandoned, which is a division of Ser. No. 11,238, Feb. 12, 1979, Pat. No. 4,298,541. This application Sep. 29, 1982, Ser. No. 426,664**

**Int. Cl.³ C07C *45/50***

**U.S. Cl. 568—454** **11 Claims**



**1.** A carbonylation process comprising reacting an organic compound selected from the group consisting of olefins, acetylenes, chlorides, alcohols, amines and amides with CO at a temperature between 50° C. and 200° C. and a total pressure between 15 and 2000 psia to produce the corresponding carbonyl in the presence of a reaction mixture comprising a homogeneous, non-charged catalyst complex of the formula:

$$[(Ar_2PQ)_ySiR_{4-y}]_g(MX_n)_s$$

wherein Ar is a substituted or unsubstituted $C_6$ to $C_{10}$ aromatic radical, Q is a substituted or unsubstituted $C_1$ to $C_{30}$ saturated open chain alkylene radical, R is an unsubstituted or monosubstituted $C_1$ to $C_{10}$ hydrocarbyl radical, M is a Group VIII transition metal selected from the group consisting of Co, Rh, Ir, Ru, Fe or Os, X is an anion or organic ligand, excluding halogen, satisfying the valence and coordination sites of the metal, y is 1 to 4, g is 1 to 6 with the proviso that g times y is 1 to 6, n is 2 to 6, and s is 1 to 3, said substituents on said aromatic radical, on said alkylene radical and on said hydrocarbyl radical being chemically unreactive with materials used, in, and the products of, a carbonylation reaction.

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## 4,480,138
## HYDROFORMYLATION PROCESS

**E. B. Hackman, Corpus Christi, and L. D. Zeagler, Pampa, both of Tex., assignors to Celanese Corporation, New York, N.Y.**

**Filed Oct. 12, 1982, Ser. No. 433,749**

**Int. Cl.³ C07C *45/50***

**U.S. Cl. 568—454** **7 Claims**

**1.** In a process for hydroformylating an olefin of 2 to 20 carbon atoms having an ethylenic double bond in the alpha position by reacting said olefin at about 80° C. to about 150° C. and superatmospheric pressure with carbon monoxide and hydrogen in admixture with a liquid medium comprising a high boiling inert reaction solvent containing an effective amount of a hydroformylation catalyst comprising a Group VIII metal in complex combination with a ligand to form a liquid reaction product mixture comprising said ligand, an aldehyde derivative of said olefin and said high boiling inert reaction solvent, the improvement comprising employing, as said high boiling inert reaction solvent, a saturated alpha-olefin oligomer, free of naphthenic and aromatic hydrocarbons, containing molecules having from 30 to 50 carbon atoms, a flash point from about 400° F. to about 500° F., an average molecular weight from about 450 to about 700 and having a kinematic viscosity at 100° C. from about 3.0 to about 8.0 centistokes.

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## 4,480,139
## ALDEHYDE ADDUCTS

**Norman Scott, Stockton-On-Tees, and Paul Hepworth, Upper Poppleton, both of England, assignors to Imperial Chemical Industries PLC, Great Britain**

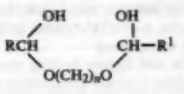
**Continuation of Ser. No. 282,953, Jul. 13, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,986**

**Claims priority, application United Kingdom, Jul. 22, 1980, 8023888**

**Int. Cl.³ C07C *43/10***

**U.S. Cl. 568—680** **3 Claims**

**1.** A compound of formula



where R and $R^1$ are individually alkyl groups having 6 to 20 carbon atoms and n is an integer in the range 2 to 12.

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## 4,480,140
## PROCESS FOR ALKYLATING PHENOLIC COMPOUNDS TO PRODUCE ORTHO OR PARA-MONOALKYLATED OR 2,4- OR 2,6-DIALKYLATED PHENOLS

**Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.**

**Filed Mar. 16, 1983, Ser. No. 475,719**

**Int. Cl.³ C07C *37/00, 39/06***

**U.S. Cl. 568—784** **38 Claims**

**1.** A process for alkylating a phenolic compound having at least two hydrogens available in the ortho-ortho or ortho-para positions to produce a monoalkylated or dialkylated phenol comprising:

(a) introducing into the phenolic compound a halogen selected from the group consisting of chlorine and bromine to produce a halogenated phenolic compound having from about six to about twenty two carbon atoms and still containing at least one free hydrogen in the ortho or para position and isolating the halogenated phenolic compound which still has one or two hydrogens at the ortho-para positions;

(b) reacting the isolated halogenated phenolic compound with a saturated aliphatic aldehyde having one to about four carbon atoms and a secondary amine having two to about eight carbon atoms, wherein the halogenated phenolic compound is in a stoichiometric amount and the amounts of aldehyde and of amine are in stoichiometric or excess of stoichiometric amount and in the liquid phase and at a temperature in the range of about 0° C. to about 100° C. to produce a Mannich base type aminoalkylated halogenated phenol;

(c) contacting the Mannich base type aminoalkylated halogenated phenol with hydrogen in the presence of a hydrogenation catalyst to produce the desired mono or dialkylated phenol and the secondary amine; and

(d) separating the secondary amine from the mixture to produce the desired monoalkylated or dialkylated phenol.

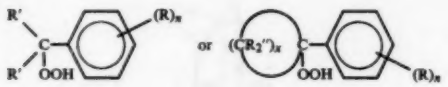
4,480,141

## CLEAVAGE OF HYDROPEROXIDES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1983, Ser. No. 507,398
Int. Cl.³ C07C 37/08
U.S. Cl. 568—798 9 Claims

1. A process for the formation Ketone and phenols by the cleavage of a secondary alkyl substituted benzene hydroperoxide of the formulae:



(I) (II)

wherein R is a $C_1$–$C_{20}$ alkyl, cycloalkyl, or alkaryl radical, R' is independently a $C_1$ to $C_{10}$ alkyl, aryl, or alkaryl radical, R'' is independently H or a $C_1$ to $C_{10}$ alkyl, aryl, or alkaryl radical, n is an integer from 0–5, and x is an integer from 2 to 11, which comprises contacting said secondary-alkyl substituted benzene hydroperoxide with about 0.1–10 weight percent boron phosphate, based on the weight of said secondary-alkyl substituted benzene hydroperoxide, at a temperature of from about 20°–200° C.

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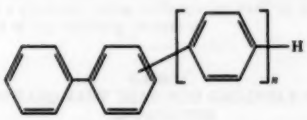
4,480,142

## CATALYTIC ALKYLATION

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 4, 1982, Ser. No. 439,004
Int. Cl.³ C07C 2/68
U.S. Cl. 585—465 13 Claims

1. A process for the selective production of 2-alkyl-substituted polycyclic aromatic compounds comprising contacting one or more aromatic reactants of the general formula



where n can equal 0 or any integer from about 1 to about 4 with at least one 1-olefin and a mole ratio of olefin to aromatic compound ranging from about 0.2:1 to about 2.5:1 at moderate temperatures between about 65° and 135° C. in the presence of a catalyst selected from the group consisting of $BF_3$ complexes, acid-treated clays, and mixtures thereof.

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4,480,143

## HYDROCARBON SYNTHESIS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,610
Int. Cl.³ C07C 1/20, 1/00
U.S. Cl. 585—469 4 Claims

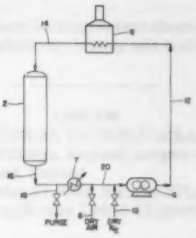
1. A process for converting as a reactant carbon sulfides selected from the group consisting of $CS_2$ and COS to a hydrocarbon or mixture of hydrocarbons ranging from $C_1$ to $C_{11}$+ wherein at least 25% thereof are $C_5$ to $C_{11}$ comprising contacting said carbon sulfides with a ZSM-5 type aluminosilicate zeolite catalyst having a constraint index of about 1 to 12 and having a silica to alumina ratio of at least 12 at about 400° to 1200° F. and a pressure of about 100 to 1000 psig in the presence of added hydrogen to produce a highly aromatic product.

4,480,144

## REGENERATION OF AROMATICS PROCESSING CATALYSTS

Fritz A. Smith, Rye, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,644
Int. Cl.³ C07C 5/24
U.S. Cl. 585—481 20 Claims



1. In a process for the conversion of an aromatic containing feedstock in which said feedstock is contacted in a reactor vessel, under conversion conditions, with a catalyst comprising a ZSM-5 type zeolite having a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, and which includes a regeneration step to burn off carbonaceous materials which deposit on said catalyst, said regeneration step comprising contacting said catalyst containing carbonaceous materials with a continuous closed loop flow of a gas stream comprising oxidizing gas and steam at regeneration conditions including a steam partial pressure of between about 0.1 psi and about 4.0 psi, a contact time of between about 12 hours and about 72 hours and a temperature of between about 700° F. and about 1000° F. the improvement which comprises:

(a) removing from said continuous closed loop flow a portion of said gas stream, and

(b) introducing into said continuous closed loop flow a quantity of a low moisture content, molecular-oxygen containing gas, said portion and said quantity being effective, collectively, to maintain, in the closed loop flow at the inlet to said reactor vessel, a molecular oxygen content no greater than about 1.0 mole percent and a water partial pressure no greater than about 1.0 psi.

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4,480,145

## CATALYSTS FOR THE CONVERSION OF METHANOL TO ETHYLENE PLUS GASOLINE

James A. Brennan, Cherry Hill; Stanley J. Lucki, Runnemede, and Hans J. Schoenagel, Lawrenceville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 419,105
Int. Cl.³ C07C 2/68; B01J 29/28
U.S. Cl. 585—640 10 Claims

1. In a process of converting methanol to ethylene plus gasoline by contacting methanol with an acidic crystalline aluminosilicate zeolite catalyst having a silica-alumina ratio of at least 12, a constraint index within the range of 1–12 and a crystal size of at least 1 micron, under conditions whereby a hydrocarbon mixture is formed containing at least about 25 wt.% ethylene, the improvement which comprises steaming said zeolite catalyst to adjust the alpha activity of said catalyst prior to use to within the range of 6–100 such as to increase catalyst cycle time and maintain a constant methanol conversion rate of between 50% to about 60% without substantial daily increases in temperature.

3. The process of claim 1 wherein said zeolite is ZSM-5.

4,480,146

## LIGHTNING PROTECTOR ASSEMBLY

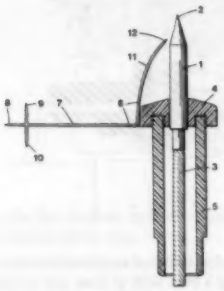
Cesare G. Invernizzi, Geneva, Switzerland, assignor to Energie Froide International SA, Geneva, Switzerland

Filed May 25, 1983, Ser. No. 497,886

Claims priority, application Switzerland, Jun. 3, 1982, 3423/82

Int. Cl.³ H02G *13/00*; H01T *1/00*

U.S. Cl. 174—3 3 Claims



1. A lightning protector assembly, characterized in that it comprises at least one electrically conductive device (6) positioned in the vicinity of a lightning rod point (1, 2) and electrically isolated from both this point (1, 2) and a conductor (3) connecting the lightning rod point to the ground, said device (6) comprising a first component (7) terminated by at least one spike (8, 9, 10) for facilitating the adjustment of the device (6) to the electric potential of the atmosphere, and a second component (11) extending as an electrode (12) positioned at a sufficiently short distance from the lightning rod point (1), so that, at least in the event of stormy weather, an electric discharge takes place between the electrode (12) and the lightning rod point (1) as a result of the voltage developed across the gap between said conductive device (6) and the lightning rod point (1), such a discharge being sufficient by itself to improve the efficiency of the lightning protector.

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4,480,147

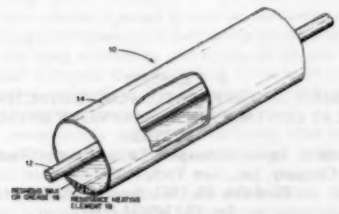
## CONTAMINANT TRAP FOR GAS-INSULATED APPARATUS

James L. Adcock; Marshall O. Pace, both of Knoxville, and Loucas G. Christophorou, Oak Ridge, all of Tenn., assignors to United States Department of Energy, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,209

Int. Cl.³ H01B *9/06*; H02G *5/06*

U.S. Cl. 174—14 R 4 Claims



1. An electrical apparatus comprising:

an electrical conductor;

a housing spaced from said conductor;

a gas having a high dielectric constant disposed in the space between said conductor and said housing;

a resinous body disposed on the inside wall of said housing in a lowermost portion thereof, said resinous body being formed of a material which is sufficiently sticky at ambient temperature to immobilize contaminant particles accumulated in said gas on the exposed surfaces thereof and capable of being converted to a sufficiently molten state at elevated temperatures to allow said particles previously adhering to the said sticky surface to become completely embedded in said resinous body so that the sticky surface of said resinous body is renewed to a particle-less condition;

an electric resistance heating element disposed in said resinous body for selectively heating said body to said molten state.

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4,480,148

## ELECTRICAL DEVICE PACKAGE

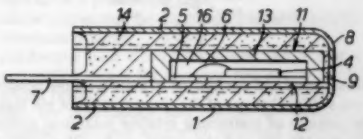
Steven K. Archer, Wiltshire, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 11, 1982, Ser. No. 377,059

Claims priority, application United Kingdom, May 13, 1981, 8114541

Int. Cl.³ H05K *5/04*

U.S. Cl. 174—51 19 Claims



1. An electrical device package, comprising an open ended container and an enclosure defining a cavity, which enclosure is formed by a housing that is open on one side and has a closure therefore, an electrical device mounted on a substrate positioned within the cavity and sealed therein by the closure, which enclosure is positioned in the container and is sealed therein by a filling of moulding material wherein the substrate is a lead frame providing electrical leads extending from the open end of the container to provide external electrical connections to the device.

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4,480,149

## LIGHTWEIGHT FRAME-TYPE ELASTOMER DAMPING SPACER

Ronald G. Hawkins, and John E. Muniak, both of Massena, N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1982, Ser. No. 447,248

Int. Cl.³ H02G *7/12*

U.S. Cl. 174—42 6 Claims

1. An inexpensive, lightweight damping spacer having substantially all metallic components thereof made from wrought materials, said spacer comprising:

a frame having two opposing plates, said frame being an inexpensive wrought metal stamping,

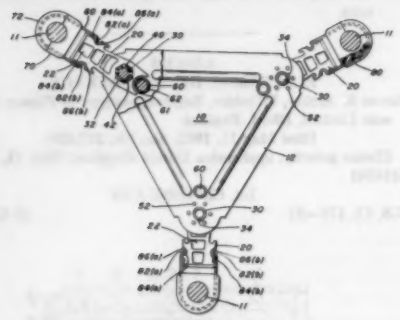
conductor clamp arms located between the plates and extending outwardly therefrom, each clamp arm provided with at least one noncircular opening extending therethrough, said clamp arms being inexpensively made from extruded metal,

means attached to the frame for securing the clamp arms between the opposing plates, said means including extruded metal pivot pins having shanks provided with noncircular cross-sectional shapes, each shank extending through the noncircular opening provided in the respective clamp arm to secure said arms in a manner that permits rotational movement of the arms about the respective

pins, the ends of said pivot pins being rigidly fixed to the respective plates,

stop pins positioned between the opposing plates and rigidly fixed to at least one plate, each stop pin engaging the respective clamp arm in a manner that prevents the arm from excessive rotational movement about the respective pivot pin, said stop pins also being made from extruded metal,

elastomer damping collars respectively located on the pivot pins and extending through the respective openings provided in the arms, each collar having an internal opening



surface sized and configured to mate with the noncircular cross-sectional shape of the respective pivot pin shank for the purpose of restraining relative rotational movement between the pin and the collar, each collar additionally having an external surface sized and configured to mate with the associated noncircular clamp arm opening to restrain relative rotational movement between the collar and the arm, and

means located respectively on the outwardly facing end of each clamp arm for clamping each clamp arm to its respective conductor.

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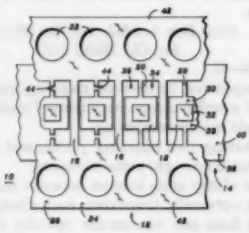
**4,480,150**

## LEAD FRAME AND METHOD

**Raymond N. Jones; John M. Lawson, both of Scottsdale, and O'Dell F. Keil, Phoenix, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jul. 12, 1982, Ser. No. 397,662**
**Int. Cl.³ H01L *23/48;* H05K *5/02***
**U.S. Cl. 174—52 FP** **13 Claims**



1. A lead frame comprising:

at least one runner presenting parallel opposite upper and lower faces thereof;

a plurality of bonding pads detachably affixed to said runner, said bonding pads presenting opposite upper and lower surfaces thereof; and

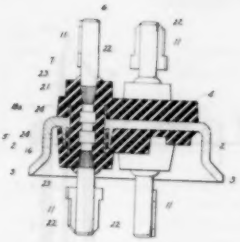
a tape strip adhesively and removably secured to said runner lower face and bonding pad lower surfaces.

**4,480,151**

## TEMPERATURE STABLE HERMETICALLY SEALED TERMINAL

**Hilliard Dozier, c/o U.S. Terminals, Inc., 7502 Camargo Rd., Cincinnati, Ohio 45243**

**Filed Jul. 19, 1982, Ser. No. 399,308**
**Int. Cl.³ H01R *9/16;* H01B *17/26***
**U.S. Cl. 174—153 R** **6 Claims**



1. A hermetically sealed terminal construction comprising a support member having a base with at least one annular opening therein and a rounded annular shoulder at said opening, a first cylindrical sleeve in the form of an insert having a cylindrical body and an outwardly projecting annular flange surrounding said cylindrical body fitted in said opening and projecting outwardly from at least one side of said base with said annular flange seated against and welded to said base in the area of said annular shoulder, a second cylindrical sleeve surrounding said first sleeve in spaced relation thereto, said second cylindrical sleeve being integrally formed with said base and affixed at one end to said base in the area surrounding said opening, said sleeves defining an annular recess therebetween, an elongated terminal pin extending centrally through said sleeves, and a molded dielectric sealing member securing said terminal pin to said support member, said sealing member being bonded to said terminal pin and to the opposite surfaces of said base with integral portions thereof filling said first sleeve and said annular recess and bonded to the inner and outer surfaces of said sleeves, whereby to effectively increase the area of interface between said sealing member and said support member to thereby inhibit the formation of leakage paths from one side of the support member to the other due to thermal expansion and contraction of the parts.

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**4,480,152**

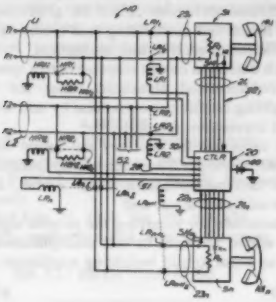
## METHODS AND APPARATUS FOR PROTECTING LINE RELAY CONTACTS IN A TELEPHONE SWITCHING SYSTEM

**Raymond G. Taylor, Shreveport, La., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Feb. 26, 1982, Ser. No. 352,748**
**Int. Cl.³ H04M *1/00***
**U.S. Cl. 179—81 R** **10 Claims**

1. A method of protecting line relay contacts from power surges appearing on a telephone line wherein a line relay is signaled to open or close its line relay contacts to connect or disconnect the telephone line with a particular station set, the telephone line having a hold relay associated with the line, the method comprising the step of:

energizing a hold relay associated with the telephone line to place a hold bridge across the line at a time prior to signaling the line relay to open or close the line relay contacts on the telephone line.



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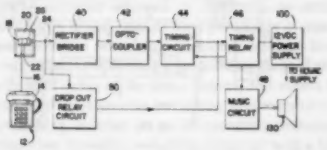
**4,480,153**

## MUSICAL-OUTPUT ADAPTER FOR TELEPHONES

**Lawrence M. Festa, 238 Cajon St., Laguna Beach, Calif. 92651**

**Filed Apr. 4, 1983, Ser. No. 481,723**
**Int. Cl.³ H04M *11/02***
**U.S. Cl. 179—84 T** **11 Claims**




1. A musical-output adapter for telephones to be used in place of a ringing bell or in conjunction therewith, comprising:

a first electronic circuit adapted to be operably coupled to the incoming signal of a telephone line, said first electronic circuit including:

means to convert alternating current into direct current coming from said incoming signal,

an opto-coupler connected to said means to convert alternating current into direct current, whereby direct current is fed to said opto-coupler,

a timing circuit connected to said opto-coupler from which current is passed to activate said timing circuit,

a timing relay connected to said timing circuit, said timing relay being actuated by said timing circuit; and

a second electronic circuit defining a music circuit connected to said timing relay, said music circuit being activated when said timing relay is closed;

a DC power supply coupled to said timing relay to allow DC voltage to continuously activate said music circuit when said relay is closed;

a speaker means connected to said music circuit, whereby music is received from said music circuit when said music circuit is activated; and

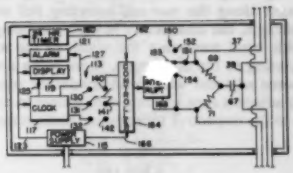
a drop-out-relay circuit connected and responsive to said incoming signal of said telephone line to activate said drop-out-relay circuit so as to provide a normally closed mode, said drop-out relay circuit being further interconnected between said timing circuit and said timing relay, whereby said music circuit is controlled.

**4,480,154**

## AUTOMATIC TELEPHONE SILENCER

**Maurice M. Klee, 262 Euclid Ave., Fairfield, Conn. 06430**

**Continuation-in-part of Ser. No. 216,660, Dec. 15, 1980, Pat. No. 4,384,171. This application May 16, 1983, Ser. No. 495,088**
**Int. Cl.³ H04M *1/21, 11/02***
**U.S. Cl. 179—84 C** **14 Claims**




11. Apparatus for automatically silencing a telephone ringer in a modular jack telephone system comprising:

an electrically operated alarm clock including means for connecting the alarm clock to a source of electrical current and means for setting the alarm clock, said setting means having a SET state in which the alarm is set to operate at a preselected time;

modular connecting means compatible with a modular jack telephone system;

a conductive path electrically connected to said modular connecting means for carrying ringing current to a telephone ringer;

means for interrupting said conductive path, electrically isolated from said source of electrical current, having a closed state in which said ringer can receive sufficient ringing current to ring and an open state in which said ringer cannot receive sufficient current to ring and is silenced; and

means associated with said setting means and said interrupting means for transferring said interrupting means to its open state when said setting means is in its SET state while maintaining said interrupting means electrically isolated from said source of electrical current.

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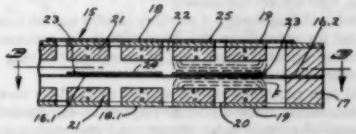
**4,480,155**

## DIAPHRAGM TYPE MAGNETIC TRANSDUCER

**James M. Winey, White Bear Lake, Minn., assignor to Magnepan, Inc., White Bear Lake, Minn.**

**Filed Mar. 1, 1982, Ser. No. 353,847**
**Int. Cl.³ H04R *9/00***
**U.S. Cl. 179—115.5 PV** **11 Claims**



1. An audio frequency signal current carrying transducer, comprising

a diaphragm having a vibratable area,

a pair of magnetic backings connected with the diaphragm in confronting and spaced relation to each other and respectively on opposite sides of the diaphragm, each of said magnetic backings having an armature plate with a multiplicity of elongate magnetized strips spaced from each other and magnetized in a direction transverse to the diaphragm and having elongate front faces defining pole faces confronting the diaphragm, the pole faces of each magnet strip being opposite to and confronting a magnetized strip of like polarity in the opposite magnetic back-

ing, the pole faces of adjacent magnetized strips and of opposite polarities producing elongate magnetic fields projecting toward the diaphragm, adjacent magnetic fields being separate and distinct from each other,

and a multiplicity of signal current carrying conductor runs on the diaphragm and confronting adjacent magnetized strips of opposite polarities and the spaces therebetween of both magnetic backings, the discrete conductors in each run adjoining each other and covering the entire diaphragm along the run and asserting full control of the diaphragm, the conductors in each run being arranged in a wide band traversing the width of the magnetic field projecting to the diaphragm, there being a narrow space between adjacent wide band conductor runs to maintain such adjacent runs separate and distinct in embraced relation to the respective separate and distinct magnetic fields.

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**4,480,156**

## ECHO CANCELLER SYSTEM

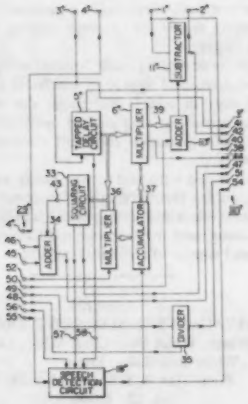
**Kenzo Takahashi, and Takashi Sakamoto, both of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan**

**Filed Nov. 9, 1981, Ser. No. 319,783**

**Claims priority, application Japan, Nov. 15, 1980, 55-160110; Oct. 15, 1981, 56-164635**

**Int. Cl.³ H04B *3/20***

**U.S. Cl. 179—170.2** **6 Claims**




1. An echo canceller unit circuit for combining an inverted echo estimate signal derived from a receive signal with a send signal, said circuit comprising:

a delay circuit having a plurality of taps and an input terminal for connection to a receive path for processing a receive signal thereon, said receive signal having an echo estimate portion;

said taps providing output signals delayed by successively increasing intervals with respect to the receive signal applied to said delay circuit, and comprising a first tap having the least delay and a last tap having the greatest delay;

a plurality of multipliers, each multiplier weighting the output from a corresponding one of said taps;

an adder for summing the outputs from said multipliers;

a subtractor for reversing the polarity of the output signal from said adder and adding the reversed polarity output signal to a send path;

a weighting coefficient correction circuit having an input terminal connected to said receive path and a plurality of output terminals connected to respective ones of said multipliers, for adjusting the weighting coefficients applied to said multipliers in such a way that the receive signal applied to said delay circuit and the output signal from said subtractor substantially have no correlation with each other;

a multiplication factor circuit coupled to said weighting coefficient correction circuit for generating a multiplication factor and multiplying said factor by the weighting coefficient of each of said multipliers;

a speech detection circuit responsive to a speech level above a predetermined threshold value for inhibiting the weighting coefficient correction by said weighting coefficient correction circuit;

output terminals for delivery an output from said delay circuit, an output from each of said multipliers, the output from said multiplication factor circuit, and the output from said subtractor; and

input terminals for receiving the receive signal, an input to said adder, an input to said multiplication factor circuit and an input to said weighting coefficient correction circuit.

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**4,480,157**

## OVERHEAD RUNNING CARRIER

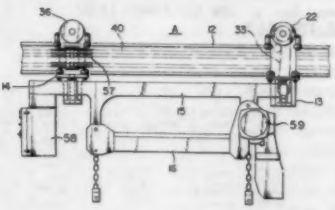
**Takashi Ishikura; Joji Mino; Kiyomi Sato, and Takaaki Nagato, all of Osaka, Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan**

**Filed Jul. 26, 1982, Ser. No. 401,860**

**Claims priority, application Japan, Nov. 27, 1981, 56-189114**

**Int. Cl.³ B61B *3/02;* E01B *25/22;* B60L *5/38;* B60M *1/30***

**U.S. Cl. 191—34** **11 Claims**



1. An overhead running carrier for running on an I-beam monorail having an upstanding web and two vertically-spaced horizontally-disposed plates, the upper one of said plates being at the top of said web and constituting a load-bearing member, said carrier comprising

a driving carriage adapted to travel along said monorail;

a driven carriage spaced from said driving carriage and adapted to run along said monorail;

a load bar spanning between said carriages;

each of said carriages having a horizontal axle above said upper plate and a supporting wheel mounted on said axle providing a rolling support for the associated carriage along the top of said upper plate, and two sets of four guide rollers, an upper set engaging the opposite sides of the upper plate of said monorail, and a lower set engaging the opposite sides of the lower plate of said monorail, the rollers of said upper and lower sets of rollers being mounted for rotation about vertical axes and engaging the opposite side edges of the respective plates;

an upright pin mounted on each of said carriages to support said load bar for pivotal movement thereon;

trolley bus means mounted on said monorail and extending parallel to said web;

electrically-actuated drive means carried by said carrier and operable to drive said driving carriage along said monorail;

said electrically-actuated drive means comprising a motor and a motor-driven pulley on said driving carriage rotatable on an axis parallel to said axle, a second pulley mounted for rotation with said supporting wheel, and a

toothed drive belt interconnecting said pulleys so as to drive said wheel upon actuation of said motor-driven pulley; and

electrical connections carried by said driven carriage having collector shoes slidably engaging said trolley bus means to energize and control said electrically-actuated drive means.

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**4,480,158**

## TIME DELAY SWITCHING DEVICE

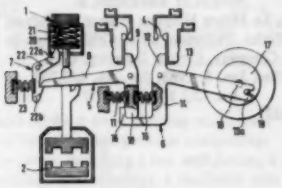
**Walter Will, Wuppertal, Fed. Rep. of Germany, assignor to Westinghouse FANAL-Sc'altgeräte GmbH, Wuppertal, Fed. Rep. of Germany**

**Filed Feb. 16, 1983, Ser. No. 466,936**

**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205406**

**Int. Cl.³ H01H *7/03, 43/00***

**U.S. Cl. 200—34** **19 Claims**



1. A time delay switching device comprising at least two switch means, timer means for controlling a time of actuation of the switch means, each of said switch means includes a movable switching member adapted to control a switching operation of the switch means, means for operatively connecting one of said movable switching members to said timer means so as to immediately influence a positioning thereof after an expiration of a time delay of the timer means, and means for coupling the other of the movable switching members to said one movable switching member so as to transmit a switching movement to the other movable switching member with a time delay.

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**4,480,159**

## SUB-MINIATURE THREE POSITION SWITCH WITH BUILT-IN LEVER LOCK

**Francis D. Kirchoff, Newton, Mass., assignor to Alco Electronic Products, Inc., Andover, Mass.**

**Continuation-in-part of Ser. No. 337,594, Jan. 7, 1982, abandoned. This application Aug. 23, 1983, Ser. No. 525,717**

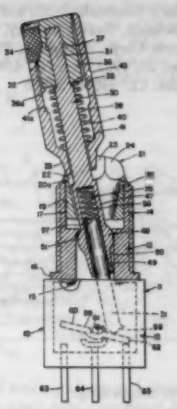
**Int. Cl.³ H01H *9/20***

**U.S. Cl. 200—42 T** **4 Claims**

1. A sub-miniature lockable toggle switch of the type having a housing with a lower portion containing a rocker switch contact and switch terminals and an upper portion, an elongated toggle lever for actuating said rocker, including a handle and a bulbous spherical portion, said upper portion containing an internal bearing for said bulbous spherical portions and having a lever lock with a plurality of recesses for seating a spring pressed detent on the handle of the toggle lever and a slot for guiding the lever in a single plane of oscillation characterized by:

said upper portion of said housing being cylindrical, having a comparatively large, internal diameter portion, above said internal bearing, and having a one piece, lever lock insert sleeved therewithin;

said one piece, lever lock insert having an integral dome with a left recess, a central recess, a right recess, and a guide slot with parallel walls, central of said recesses, each recess having a generally circular, large outer opening for selectively receiving said detent and each having a smaller, inner opening jointly merging into said parallel



walls of said guide slot, and of less length than the overall length of said recesses, for guiding said lever.

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**4,480,160**

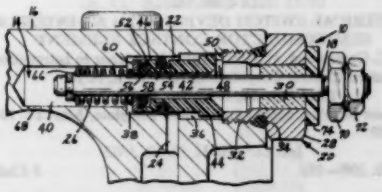
## DIFFERENTIAL PRESSURE SWITCH

**Jack Stifelman, Minneapolis, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.**

**Filed Aug. 31, 1982, Ser. No. 413,550**

**Int. Cl.³ H01H *35/38***

**U.S. Cl. 200—82 R** **20 Claims**



1. Switch apparatus in combination comprising:

a housing connected electrically to ground, said housing having a cavity therein;

a post connected conductively to an electrical source;

means for supporting said post cantilevered within the cavity, said supporting means including means for sealing said cavity between said post and said housing;

means for communicating high pressure fluid to said cavity;

means for communicating low pressure fluid to said cavity;

means, guided by said post, for maintaining separation between said high and low pressure fluids within said cavity;

means for biasing said separation maintaining means against said high pressure; and

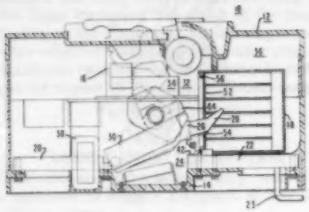
means for disconnectably connecting electrically said post and said housing.

4,480,161

## CIRCUIT BREAKER UTILIZING IMPROVED ARC CHAMBERS

Walter J. Kellogg, Black Mountain, N.C., and Allan V. Heberling, Daugherty Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1983, Ser. No. 488,234
Int. Cl.³ H01H 33/08
U.S. Cl. 200—144 R 16 Claims



1. A circuit breaker, comprising:

(a) first and second spaced apart stationary contacts disposed within a housing;

(b) a movable contact disposed within said housing and operable between electrically open and closed positions with respect to said stationary contacts;

(c) a movable arcing contact disposed within said housing and operable between electrically open and closed positions with respect to said stationary contacts;

(d) movement effecting means for effecting movement of said movable and arcing contacts between said open and closed positions;

(e) an arc grid assembly having a framework formed of a rigid material that may be temporarily plasticized; and

(f) an arc grid assembly cavity defined by a portion of said housing having restraining means disposed to interfere with said rigid arc grid assembly frame, should said frame be acted upon by forces tending to expel said frame from said cavity, said arc grid assembly being disposed within said cavity when said framework is in the temporary plasticized state.

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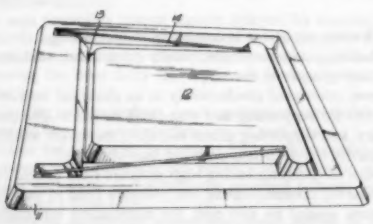
4,480,162

## ELECTRICAL SWITCH DEVICE WITH AN INTEGRAL SEMICONDUCTOR CONTACT ELEMENT

John C. Greenwood, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,410
Claims priority, application United Kingdom, Mar. 17, 1981, 8108280
Int. Cl.³ H01H 57/00, 3/02
U.S. Cl. 200—181 3 Claims



3. An electrical contact unit, comprising

a housing;

fixed electrical contacts disposed in said housing;

a contact element of an effectively electrically insulating material mounted in said housing and including

a supporting body,

an armature integral with and hingedly connected to said supporting body, and

restraining means integral with said supporting body and said armature and operative for restraining the displacement of said armature relative to said supporting body;

at least one electrical contact disposed on said armature for displacement therewith into and out of contact with said fixed contacts; and

means for displacing said armature relative to said supporting body under the influence of electrostatic forces to engage and disengage said movable and fixed contacts.

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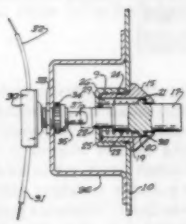
4,480,163

## VANDAL-RESISTANT PUSH BUTTON ELECTRICAL SWITCH ASSEMBLY

Earl L. Morris, La Habra Heights; Walter V. Hafner, Whittier, and Ron T. Hahn, Fullerton, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 5, 1983, Ser. No. 455,753
Int. Cl.³ H01H 13/00
U.S. Cl. 200—331 7 Claims



1. A Vandal-resistant push button switch assembly comprising:

a mounting plate having a first surface which faces the direction from which the switch is operated and a second surface on the other side thereof;

a sleeve and escutcheon member having a sleeve end extending through an opening in the mounting plate said sleeve end having an outside diameter and an escutcheon end abutting the first surface of said plate and having an escutcheon held thereon;

a push button and actuating shaft assembly having a push button end extending away from the first surface beyond the escutcheon end and an actuating shaft extending away from the second surface and being extendable beyond the sleeve and escutcheon member, said push button and actuating shaft assembly being held within said sleeve and escutcheon member and having stop means located between the ends thereof;

holding means affixed to the exterior of the sleeve end of the sleeve and escutcheon member holding said escutcheon against the mounting plate, and said holding means further having an opening to permit contact of the actuating shaft with electrical switch means;

spring means surrounding the actuating shaft of the push button and actuating shaft assembly, said spring means abutting said stop means at one end and said holding means at the other end; and

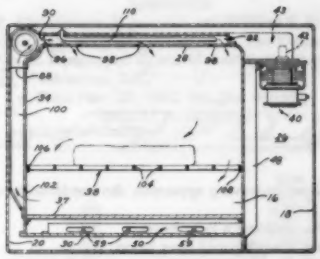
electrical switch means held axially with respect to the push button and actuating shaft assembly and positioned so that the switch means is activated by contact with the actuating shaft when the push button is depressed.

4,480,164

## FOOD BROWNING SYSTEM INCORPORATING A COMBINED MICROWAVE AND HOT AIR OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 3, 1982, Ser. No. 446,445
Int. Cl.³ H05B 6/70
U.S. Cl. 219—10.55 B 6 Claims



1. A food cooking oven utilizing microwave heating energy and forced hot air heating means comprising:

an oven cavity including a top wall having a plurality of air circulating inlet openings, a rear wall, side walls wherein one of said side walls has an air circulating outlet opening positioned in the lower portion thereof, and an access front opening;

a horizontally disposed food rack within said oven cavity being supported on said side walls spaced from said bottom wall above said air circulating outlet in said one of said side walls;

generator means operable for supplying microwave heating energy into said oven cavity;

a housing means positioned at the intersection of said top wall and said one of said side walls including an outlet adjacent said top wall;

an air circulation passageway on said top wall extending from said housing to a position enclosing said plurality of air circulating inlet openings in said top wall;

said plurality of air circulating inlet openings being arranged in a row in said air circulating passageway being dimensioned to progressively increase in cross-sectional area in a downstream direction with the smallest inlet opening located adjacent said housing outlet so that air flow through said inlet openings is substantially equal across the upper portion of said oven cavity;

a heater arranged in said air circulation passageway for heating air passing therethrough;

an inlet air circulation passageway on said one of said side walls extending from an inlet to said housing to said air circulation outlet opening in a position below said food rack in said one of said side walls;

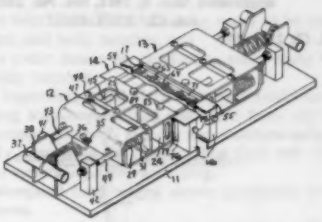
air impelling means in said housing for directing air into said air circulation passageway over said heater and through said plurality of air circulating inlet openings in said top wall of said oven cavity, and for drawing air into said inlet air circulation passageway through said air circulating outlet opening in the lower portion of said one of said walls in said oven cavity to thereby establish a forced recirculatory flow of heated air through said oven cavity between said air circulating inlet openings in said top wall and said air circulating outlet opening in said one of said side walls below said food rack whereby food in said oven cavity is exposed to said microwave heating energy and said heated recirculated air from above and below said food rack.

4,480,165

## BRAZE FIXTURE AND METHOD OF USING

Frederick W. Haushalter, Kenton; Stanley J. Coughlin, Findlay, and Khalid Pervaiz, Marion, all of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 2, 1981, Ser. No. 326,561
Int. Cl.³ B23K 1/04
U.S. Cl. 219—85 R 4 Claims



1. A method of making a heat exchanger comprised of longitudinally spaced apart tube connected header plates and fin material positioning between the tubes intermediately of the header plates, the header plates having apertures through which the tube ends project to terminate adjacent to respective outer header walls, including the steps of outwardly flaring tube end extremities, applying manifold members to said outer header walls to intercommunicate at least certain tube ends, in a holding fixture applying simultaneous continuous pressures firstly to urge a separating motion of said header plates outward into contact with respective outwardly flared tube extremities, secondly to urge said manifold members into contact with respective outer header walls, and thirdly to urge said fin material into contact with adjacent tube exteriors, and while parts are so held and pressured subjecting them to a brazing operation joining tube ends and manifold members to header plates and joining fin material to tube exteriors.

4,480,166

## RESISTANCE WELDING OF ZINC-COATED STEEL

Howard E. Leech, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 14, 1983, Ser. No. 475,318
Int. Cl.³ B23K 11/16; B32B 15/01
U.S. Cl. 219—118 3 Claims

1. A method for forming a hermetic weld between zinc-coated steel members, at least one of said members having a metallic copper layer between the zinc coating and the steel, said method comprising temporarily heating faying surfaces of the members to fuse the steel, said heating being generated by an electrical current passing between the members at the faying surfaces and applied by electrodes in contact with a surface of each member remote from the faying surface, said copper layer extending at the faying surface and the electrode contact surface of said one member, said copper layer at the faying surface being sufficient to melt during heating, flow into fissures formed in the fused steel and thereafter solidify to hermetically seal the weld, said copper layer at said electrode contact surface being sufficient to protect the underlying steel

against corrosion despite zinc vaporization from said surface during welding.

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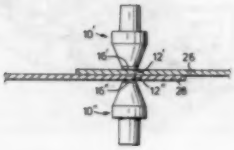
**4,480,167**
**WELDING ELECTRODE**
**John H. Huys, R.R. 1, Bolton, Ontario, Canada (L0P 1A0), and David Venne, 124 Neddie Dr., Agincourt, Ontario, Canada**
**Continuation-in-part of Ser. No. 36,906, May 7, 1979,. This application Mar. 4, 1981, Ser. No. 240,516**
**Int. Cl.³ B23K *35/22***
**U.S. Cl. 219—119** **6 Claims**




1. An electric resistance welding electrode shaped to define a tip surface for contact with a workpiece during welding and comprising an electrode body of a first material having a relatively low electrical resistivity, and a layer of a second material on said body defining said tip surface, said second material having a relatively high electrical resistivity and a degree of high-temperature hardness and compressive strength selected to minimize electrode distortion in use, and comprising at least 90% pure titanium, said second material being fused to the electrode body so as to form a unitary electrode therewith, and said layer of said second material having a thickness in the approximate range 1 to 5 thousandths of an inch.

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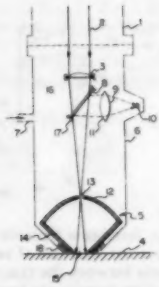
**4,480,168**
**LASER-SURFACE COUPLER**
**Paolo G. Cielo, Montreal, and Serge Dallaire, Longueuil, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada**
**Filed Mar. 29, 1982, Ser. No. 363,301**
**Int. Cl.³ B23K *27/00***
**U.S. Cl. 219—121 L** **10 Claims**



1. A laser-surface coupler for use with a laser beam to irradiate a surface area comprising:
a lower masking section having an aperture for defining the surface area to be irradiated; and
an upper section located over the masking section to form a cavity, the upper section having an opening therein for the laser beam, the cavity having inner surfaces for redirecting light reflected within the cavity from the defined surface area back towards the defined surface area thereby coupling a substantial portion of the laser beam energy uniformly across the defined surface area.

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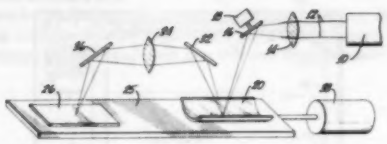
**4,480,169**
**NON CONTACT LASER ENGRAVING APPARATUS**
**John A. Macken, P.O. Box 696, Santa Rosa, Calif. 95402**
**Filed Sep. 13, 1982, Ser. No. 417,049**
**Int. Cl.³ B23K *27/00***
**U.S. Cl. 219—121 LH** **12 Claims**



1. In a laser engraving apparatus, the combination comprising:
means for emitting a laser beam;
means for scanning said laser beam;
a generally cylindrical mirror, said mirror having a curvature, orientation and position such that the scanned laser beam strikes the mirror and reflects to an area in space where the translation of the scanned laser beam has been eliminated;
an artwork image means of reduced specular reflectivity in at least proximate relation to the reflecting surface of said mirror;
a workpiece; and
a first focusing means positioned between the artwork means and the workpiece to image the artwork at the surface of the workpiece, said focusing means being positioned at or near the area in space where the translation of the scanned laser beam has been eliminated, said so-focused laser beam having sufficient power to suitably physically change said workpiece.

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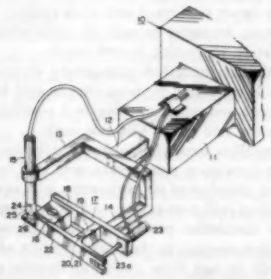
**4,480,170**
**ARC SPOT WELDING EQUIPMENT**
**Masatsune Kondou, Okazaki; Kazuhiro Itou, and Tsutomu Furuta, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**
**Filed Mar. 28, 1983, Ser. No. 479,846**
**Claims priority, application Japan, Mar. 30, 1982, 57-045249**
**Int. Cl.³ B23K *9/12*; B21J *13/08***
**U.S. Cl. 219—125.1** **12 Claims**



1. An arc spot welding equipment comprising:
an arm of an industrial robot, the end of said arm being capable to be positioned;
a hand having a first finger and a second finger, said hand being attached to the end of arm of said robot;
a positioning and clamping device attached to the second

finger for positioning and clamping a work to be welded to an object relative to said hand; and

a welding torch attached to the first finger in the state that an arc generating portion of said welding torch is directed to a portion of said work where said work is welded to an object.

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**4,480,171**

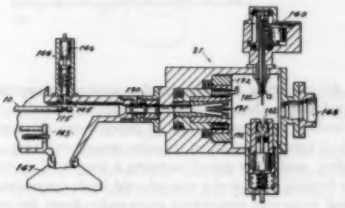
## GAS TUNGSTEN ARC WELDER WITH ELECTRODE GRINDER

**David W. Christiansen, Kennewick, and William F. Brown, West Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Nov. 30, 1982, Ser. No. 445,604**

**Int. Cl.³ B23K *9/00***

**U.S. Cl. 219—136** **7 Claims**



1. In an apparatus for automated loading of fuel assemblies for nuclear reactors, a tungsten arc welder comprising:

a sealable interior enclosure having an opening at one side for axial reception of an open end of a length of cladding;

coaxial collet means in said enclosure for gripping each length of cladding adjacent the open end thereof;

means on said enclosure rotatably journalling the collet means for motion about its central collet axis;

a movable electrode support mounted in said enclosure to one side of the collet axis for selectively positioning an electrode tip along an electrode axis perpendicular to and intersecting the collet axis;

and electrode tip machining means mounted in said enclosure to the remaining side of the collet axis for selectively refurbishing the electrode tip after use in welding the open end of a length of cladding.

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**4,480,172**

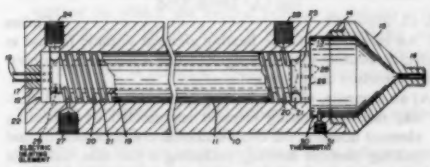
## ELECTRIC HEAT EXCHANGER FOR SIMULTANEOUSLY VAPORIZING TWO DIFFERENT FLUIDS

**Henry Ciciliot, Lorraine Cir., Allentown, Pa. 18104, and David J. Relf, PT3 Helfrich Springs, Whitehall, Pa. 18052**

**Filed Jun. 17, 1982, Ser. No. 389,224**

**Int. Cl.³ H05B *3/00*; F22B *1/28*; F23D *11/44***

**U.S. Cl. 219—305** **3 Claims**



1. A heat exchanger for simultaneously and separately producing hot fuel gas from a hydrocarbon fluid and steam from water comprising:

(a) a body member having an axial bore defined therein, said body member including:

(1) a smooth inner surface,

(2) hydrocarbon fluid inlet means for conducting hydrocarbon fluid to be vaporized into said body member,

(3) hydrocarbon fuel gas outlet means for conducting hydrocarbon fuel gas away from said body member,

(4) an enlarged bore area adjacent to said hydrocarbon fuel gas outlet means and fluidly communicating therewith.

(5) water inlet means for conducting water to be vaporized into said body member, and

(6) steam outlet means for conducting steam away from said body member;

(b) a fluid vaporizing means located in said axial bore for conducting hydrocarbon fluid and water from said inlet means through said body member and simultaneously and separately vaporizing the hydrocarbon fluid and water, said fluid vaporizing means including:

(1) an elongated thick-walled sleeve positioned in said axial bore,

(2) a heater means in said sleeve for producing sufficient heat to vaporize both of said fluids,

(3) first heat transfer means for adding a first amount of heat to water passing into said body member including a continuous helical water passage means defined in the outer surface of said elongate sleeve for fluidically connecting said water inlet means to said steam outlet means and having a first heat transfer surface means in heat transferring relation with said heater means to transfer heat to water passing into said helical water passage for vaporizing that water, and

(4) second heat transfer means for adding a second amount of heat to hydrocarbon fluid passing into said body member including a continuous helical hydrocarbon passage means defined in the outer surface of said sleeve fluidically connecting said hydrocarbon inlet to said bore enlarged area adjacent to said hydrocarbon gas outlet, said helical hydrocarbon passage means being coaxially coextensive with said helical water passage means and interjacent therewith and having a second heat transfer surface means in heat transferring relation with said heater means and being larger than said first heat transfer surface means to transfer more heat from said heater means to said hydrocarbon fluid than is transferred to said water for transferring sufficient heat from said heater means to hydrocarbon fluid passing into said hydrocarbon helical passage to vaporize that hydrocarbon fluid into hydrocarbon fuel gas whereby the same heater means is used to both vaporize water into steam and hydrocarbon fluid into hydrocarbon fuel gas separately and simultaneously in the same body member; and

(c) a temperature sensing means in said bore enlarged area for controlling energy supplied to said heater means in response to the temperature of said hydrocarbon fuel gas at said outlet means.

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**4,480,173**

## WATER HEATER

**Brian J. Butterfield, Delgany, Northern Ireland, assignor to Metal Spinners (Ireland) Limited, Newtownmountkennedy, Northern Ireland**

**Filed Jun. 22, 1981, Ser. No. 275,736**

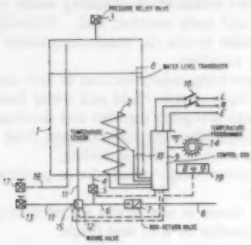
**Claims priority, application United Kingdom, Jun. 23, 1980, 8020539**

**Int. Cl.³ A47J *31/56*; F24H *1/20***

**U.S. Cl. 219—312** **5 Claims**

1. A water heater device for providing steam and hot water selectively for domestic uses such as cooking or beverage making comprising a closed water tank having a water inlet with valve means for selectively allowing and preventing ingress of water into the tank, a non-return valve for prevent-

ing water from the tank flowing back into the main supply and a pressure-reducing valve in line with said water inlet for ensuring that the water pressure in the water inlet and in the tank does not exceed a preset value, means for detecting the water level in the tank and for providing a signal indicative thereof, means for heating the water in the tank, means for detecting the temperature of water in tank and for providing a signal indicative thereof, hot water outlet means arranged towards the bottom of the tank, a hot water tap connected to a discharge end of said hot water outlet means whereat hot



water is discharged at the option of the user, steam outlet means arranged to collect steam from adjacent the top of the tank, a steam tap connected to a discharge end of said steam outlet means whereat steam is discharged at the option of the user, and control means for controlling the pressure of water in the tank, the temperature of water in the tank and the water inlet valve means, said control means receiving signals from the water level detecting means, the temperature detecting means and from a programmer device for storing a desired water temperature and providing a signal indicative of that desired temperature.

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**4,480,174**

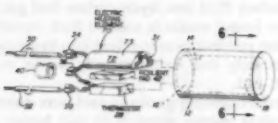
## THERMOSTATICALLY CONTROLLED ELECTRIC COMPRESSOR SUMP HEATER HAVING SELF-CONTAINED THERMOSTAT

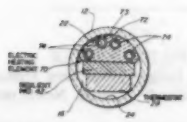
**Matt N. Hummel, Glenview, Ill., assignor to Acra Electric Corporation, Schiller Park, Ill.**

**Continuation-in-part of Ser. No. 301,144, Sep. 11, 1981, abandoned. This application Jul. 12, 1982, Ser. No. 397,586**

**Int. Cl.³ H05B** *1/02, 3/82*

**U.S. Cl. 219—331** **5 Claims**





1. In a heater having a heating element controlled by a thermostat both of which are disposed within a heat-conductive outer shell, said thermostat sensing the heat output of the heating element and controlling said heat output in response to said sensing, the improvement comprising:

a core having a series of channels in which the heating element is disposed and also having a D-shaped cross-section throughout including a curved surface and a flat surface, all of the channels being disposed approximately the same distance from the curved surface; and

a resilient member disposed between the flat surface of the core and the thermostat for urging the curved surface of the core and the thermostat into contact with opposed inner surfaces of the outer shell.

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**4,480,175**

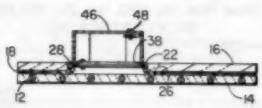
## DIRECTIONAL ELECTRICAL HEATING PANEL ASSEMBLY

**Joseph L. Brasky, Tower Hill Rd., Killingworth, Conn. 06417**

**Filed Sep. 16, 1982, Ser. No. 418,613**

**Int. Cl.³ H05B** *3/28*

**U.S. Cl. 219—345** **10 Claims**



1. An electrical heating panel assembly comprising at least two relatively thin and generally planar panels arranged in face-to-face relationship and in inner-outer relationship relative to a zone to be heated thereby, means securing said panels together, said inner panel carrying a length of electrical resistance heating wire and a pair of cold leads connected with the heating wire and projecting outwardly from the panel face, said outer panel having a through opening receiving said cold leads, a junction box mounting plate having a portion thereof arranged in and substantially fitting the wall of said through opening and having a marginal flange disposed between said panels adjacent said opening, said marginal flange and mounting plate being held firmly in position by entrapment of the flange by and between said panels and said means securing the panels together, and said mounting plate having a through opening in said portion which is arranged in the panel opening and through which said cold leads pass, a junction box associated with said mounting plate and having an opening for receiving said cold leads, means detachably connecting said junction box to said mounting plate with the box projecting outwardly from said outer panel and with the opening therein in communication with the mounting plate opening, said junction box and mounting plate when so connected electrically isolating said outer panel from the interior of the box and plate, power line entry means in said junction box for the introduction of at least a portion of a power supply line to the interior of said junction box for insulated electrical connection with said cold leads therewithin, an access opening at a top portion of said junction box opposite said cold lead opening, and a cover for said access opening in said junction box.

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**4,480,176**

## INSULATED ELECTRIC HEATING ELEMENT

**Herman E. Raskov, 6312 Seward Park Ave. South, Seattle, Wash. 98118**

**Filed Jul. 26, 1982, Ser. No. 401,640**

**Int. Cl.³ H05B** *3/68*

**U.S. Cl. 219—461** **7 Claims**

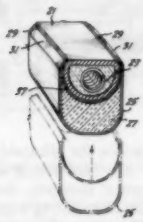
1. An insulated, electric heating element suitable for use in an electric heating system designed to emit heat in a predetermined direction comprising:

(A) an elongate, electric heating element including an electric resistive heating element surrounded by a heating element housing, the cross-sectional configuration of said heating element housing including a flat side, sidewalls lying generally orthogonal to said flat side and beveled regions extending between said sidewalls and said flat side; and,

(B) an insulating member attached to said heating element

housing along the entire length thereof on the sides thereof facing away from said predetermined direction for reducing the heat emitted by said elongate, electric heating element in directions other than said predetermined direction, said insulating member comprising:

(1) a channel of impervious material having a U-shaped cross-sectional configuration and a longitudinal configuration similar to the longitudinal configuration of said heating element housing, the edges of the legs of said



U-shaped channel being tapered inwardly, said inward tapering edges impinging on said beveled region of said heating element housing; and,

(2) insulating material mounted in said channel between the legs and cross-member thereof, the cross-sectional configuration of said channel and said insulating material being sized and located such that a region is formed between said insulating material and the legs of said channel suitable for receiving said heating element housing.

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**4,480,177**

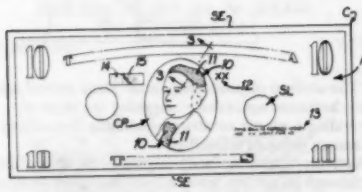
## CURRENCY IDENTIFICATION METHOD

**Milton F. Allen, 2989 McCully Dr., NE., Atlanta, Ga. 30345**

**Continuation of Ser. No. 235,532, Feb. 18, 1981,. This application May 26, 1983, Ser. No. 498,263**

**Int. Cl.³ G08B** *15/02*

**U.S. Cl. 235—379** **12 Claims**



1. A method of treating paper money with opposed surfaces and a central portrait printed on one of the surfaces for the purpose of identifying same comprising the steps of:

applying to that surface of the paper money opposite the surface on which the central portrait is printed a first treating material to form a source identifying code thereon where said first treating material is normally invisible but is rendered visible under ultra violet light; and

applying a mixture of liquid adhesive and gritty material over a portion of the central portrait, and

allowing the mixture to dry to form a layer defining a textured surface thereon distinguishable by feel from that of the surface of the paper money to aid in the detection of the paper money during the handling thereof by bank personnel.

**4,480,178**

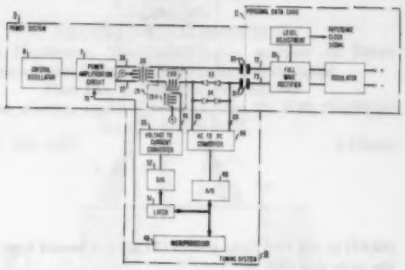
## TUNING ARRANGEMENT FOR INTERFACING CREDIT CARD-LIKE DEVICE TO A READER SYSTEM

**Robert R. Miller, II, Convent Station; Charles Small, Freehold, and John H. Stothoff, Plainsboro, all of N.J., assignors to AT&T Information Systems, Holmdel, N.J.**

**Filed Apr. 4, 1983, Ser. No. 481,832**

**Int. Cl.³ G06K** *5/00*

**U.S. Cl. 235—380** **16 Claims**



1. An automatic tuning arrangement for maximizing power transfer from a signal source to a complex load impedance including a resistive component, the arrangement comprising:

means for connecting said signal source to the resistive component of said complex load impedance;

capacitive coupling means (**30, 31**) connected in series between said source and said load impedance;

sensing means (**33, 34**) for providing an electrical signal indication reflective of said power transfer; and

variable inductance means (**29**) responsive to the electrical signal from said sensing means and connected in series with said load impedance for nulling the effect of said capacitive coupling means to obtain the desired maximum power transfer.

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**4,480,179**

## APPARATUS FOR CODING AND/OR DECODING A DOCUMENT

**Louis F. Schaefer, Palo Alto; Termpoon Kovattana, Menlo Park, both of Calif., and Tommy Henningson, Järfälla, Sweden, assignors to Esselte Nordia AB, Solna, Sweden**

**Filed Sep. 21, 1982, Ser. No. 420,628**

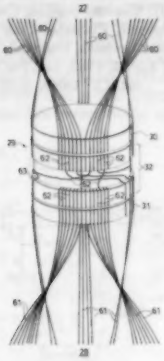
**Claims priority, application Sweden, Sep. 30, 1981, 8105770**

**Int. Cl.³ G06K** *7/14*

**U.S. Cl. 235—473** **7 Claims**

1. An apparatus for coding and/or decoding a document, comprising a light path (**27,28,29**) formed of optic fibres and capable to direct light from a lens (**25**) or lens system for focusing the light from a document to be coded or decoded to a light-sensitive means, such as a photoconductive drum (**18**), for recording a coded and, respectively, uncoded copy of an uncoded and, respectively, coded document, characterized in that said light path (**27,28,29**) along at least a section consists of a coding and/or decoding unit (**29**) comprising a code disc (**32**) provided with optic fibres (**62**), the respective ends of which are connected to a first and, respectively, second light guide (**27** and, respectively, **28**) associated with the light path, that the fibres (**62**) at one end surface of the code disc (**32**) have a different mutual order than at the other end surface of the code disc (**32**), that the ends of said fibres (**62**) are located along a circle at the respective end surface of the code disc (**32**) as the end of the first (**27**) and, respectively, second (**28**) light guide facing to the code disc (**32**) has its fibres (**60,61**) located along

a circle with equal diameter, and that the code disc (32) is rotatable to different positions of rotation where all fibres



(60,61) in the two light guides (27,28) are bound together via the code disc (32).

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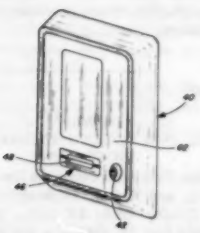
4,480,180

**CARTRIDGE ASSEMBLY FOR DATA-SENSING SYSTEM**

Charles R. Fisher, 34781 Glen Dr., Eastlake, Ohio 44094

Filed May 7, 1981, Ser. No. 261,683
Int. Cl.³ G06K *13/00*
U.S. Cl. 235—475 12 Claims



1. In a data-sensing system of the type for reading coded information on a data carrier, such as a credit card, security card or other such identification card, comprising:

(a) a terminal console;

(b) a cartridge means operably associated with said terminal console;

(c) said cartridge means including at least one read-head member adapted for pivotal movement toward and away from another read-head member;

(d) said read-head members together defining a passageway therebetween adapted to removably receive a data-carrier;

(e) said read-head members including electronic control circuit means adapted for connection to a power means; and,

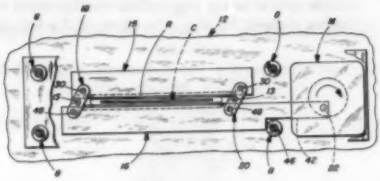
(f) said read-head members are resiliently attached adjacent one end interiorly of said terminal console and are adapted for automatic pivotal movement away from one another upon removal of said read-head members from said receptacle means.

4,480,181

**CARD CAPTURE DEVICE**

Charles R. Fisher, 34781 Glen Dr., Eastlake, Ohio 44094

Filed Dec. 23, 1982, Ser. No. 451,533
Int. Cl.³ G06K *7/00*
U.S. Cl. 235—486 6 Claims



1. A card capture device for releasably holding a card or badge to be encoded in a card reader device comprising a housing adapted to mount interiorly thereof a card reader device, said capture device including a pair of oppositely disposed capture bar members, articulated link means for holding said bar members together for opening and closing movement relative to one another for holding said card or badge in clamped relation therebetween upon actuation of a motor drive means.

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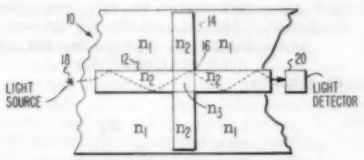
4,480,182

**SINGLE PLANE OPTICAL MEMBRANE SWITCH AND KEYBOARD**

Richard I. Ely, and Carl E. Mosier, both of Orange Park, Fla., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1982, Ser. No. 358,822
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 7 Claims




1. The method of producing single plane optical membrane switch/keyboard apparatus comprising the steps of;

providing a plastic substrate containing a monomer with a known index of refraction;

selectively exposing said substrate to ultra-violet light through a pattern mask effectively photo-polymerizing said monomer and producing individual horizontal light guides in the exposed areas having an index of refraction higher than the original substrate prior to photo-polymerization;

removing the unpolymerized monomer;

rotating said mask;

exposing said substrate to ultra-violet light through the mask photo-polymerizing said monomer and producting individual vertical light guides in the exposed areas;

removing the unpolymerized monomer;

the double exposure of the horizontal and vertical light guides at the points of intersection thereof produces a still higher index of refraction than either the initial substrate or the horizontal and vertical light guides;

providing a light source for said light guides;

providing a light detector for each of said light guides; and

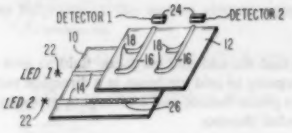
providing coupling means for coupling the light from the horizontal light guide into the vertical light guide so as to be detected in the vertical light guide.

4,480,183

## MULTI-PLANE OPTICAL MEMBRANE SWITCH APPARATUS

Richard I. Ely, Orange Park, and Wunnava V. Subbarao, Miami, both of Fla., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1982, Ser. No. 358,823
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 5 Claims



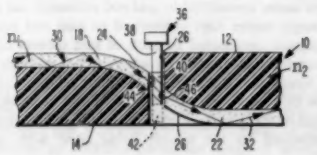

1. Multi-plane optical membrane switch apparatus comprising:
- a first clear, semi-rigid, membrane-like, plastic member;
- a second clear, semi-rigid, membrane-like, plastic member disposed in spaced apart parallel relation to said first plastic member;
- a plurality of fiber optic channel plastic members disposed on said first plastic membrane-like member;
- a plurality of fiber optic channel forming members disposed on said second plastic member at right angles to said first plurality of fiber optic channel forming members;
- light generating means at one end of each one of said first plurality of fiber optic channel members;
- light receiving means at one end of each one of said second plurality of channel members; and
- means for applying pressure to the intersecting areas of said first and second optic channel members effective to couple light from one of the first to one of the second channel members.

4,480,184

## MOLDED OPTICAL WAVEGUIDE SWITCHING APPARATUS

Richard I. Ely, Orange Park, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1982, Ser. No. 358,826
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 7 Claims



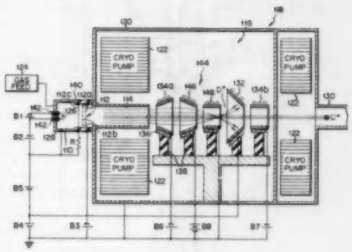

1. Molded optical waveguide switching apparatus comprising;
- a base member of light transmitting material having an index of refraction $N_2$;
- said base member including a plurality of obverse and reverse light conducting grooves arranged in an orthogonal array with the horizontal grooves of the obverse side of said base member at right angles to the vertical grooves of the reverse side of said member;
- light generating means disposed adjacent to one end of each obverse groove, light receptor means disposed adjacent to one end of each reverse groove,
- an individual tap member disposed at the intersection of each horizontal and vertical column groove with the taps of the horizontal grooves oriented toward the taps of the vertical column grooves;
- an individual aperture disposed at each intersecting pair of taps, said aperture extending into and through said base member; and
- a light blocking/unblocking member arranged for movement within each aperture effective to interrupt light from said light generating means to said light receptor means indicating switch closure.

4,480,185

## NEUTRAL BEAM INJECTOR

Kiyoshi Hashimoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 9, 1981, Ser. No. 329,069
Claims priority, application Japan, Dec. 22, 1980, 55-180404
Int. Cl.³ H05H 3/02
U.S. Cl. 250—251 4 Claims




1. A neutral beam injector comprising:
- means for generating charged particles;
- a neutralizing cell for neutralizing charged particles; and
- a direct converter for recovering the energy of unneutralized charged particles passed through said neutralizing cell, said direct converter having
  - means for collecting charged particles,
  - deflecting means, interposed between said neutralizing cell and said means for collecting charged particles, for crossing and diverging beams of the charged particles,
  - first electron suppressing means interposed between said neutralizing cell and said deflecting means, and
  - second electron suppressing means arranged behind said collecting means.

4,480,186

## COMPENSATED DENSITY WELL LOGGING TOOL

Piero Wolk, 1717 Britmore Rd., Houston, Tex. 77043

Filed May 20, 1982, Ser. No. 380,266
Int. Cl.³ G01V 5/12; E21B 23/00
U.S. Cl. 250—268 16 Claims

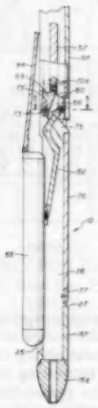
1. A compensated density well logging device for use with a lowering mechanism for measuring the density of subsurface formations through an open well bore coated with filter cake and containing drilling fluid and transmitting density signals to receiving devices on the surface, comprising:
- (a) a hollow first housing having an upper end connected to the lowering mechanism and a lower end adapted to guide the tool downward through the well bore;
- (b) a connection means mounted at the upper end of said first housing;
- (c) a pad mounted with said first housing by said connection means, said pad having a second housing and a pad interior member mounted therewith in said connection means enabling the pad to be shifted from a first position within the first housing and a second position extended through a first longitudinal slot;
- (d) radioactive source means mounted within the pad inte-

rior member, said pad interior member being opaque to radiation emitted thereby, said pad interior member defining directional window means for the controlled emission of radiation exteriorly of the device;

(e) a plurality of radiation detection means for detection of backscatter radiation from irradiated subsurface formations, and coversion of the level of radiation into an electronic signal, mounted on collimating windows formed in the pad interior member is spaced relation to said radiation source means;

(f) a caliper arm having a first end pivotally mounted on said first housing radially opposite said pad and a second end for extension through a second longitudinal slot so as to contact the well bore and position the device adjacent the opposite wall of the well bore during measurement operations;

(g) extension means connected to said pad connection means for urging said pad into said second position and further



connected to said caliper arm for radial extension thereof so as to thrust said pad into the filter cake, said extension means enabling the shifting of said pad into said second position independently of the extension of said caliper arm;

(h) actuating means mounted on said first housing connected to said extension means for restraining the shifting of the extension of said caliper arm and pad until measurement of formation densities is desired;

(i) measurement means mounted on said actuating means responsive to the position of the caliper arm with respect to the first housing for measurement of the well bore diameter; and

(j) electronic means mounted within said first and second housings for receiving, processing, and transmitting signals from said detector means and measurement means exteriorly of the device and for transmitting electric power within the device.

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**4,480,187**

## MASS SPECTROMETER

**Hisashi Matsuda, Takarazuka, Japan, assignor to Esco Co., Ltd., Tokyo, Japan**

**Filed Jul. 27, 1982, Ser. No. 402,257**

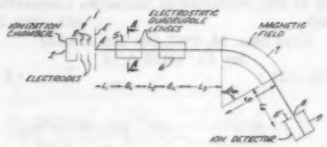
**Claims priority, application Japan, Jul. 29, 1981, 56-118645**

**Int. Cl.³ B01D *55/44***

**U.S. Cl. 250—296** **18 Claims**

1. A mass spectrometer of the type comprising an ion source for emitting accelerated ions, means forming a slit through which ions are emitted from said source, a deflecting magnetic field for deflecting said ions after said ions pass through said slit, and an ion detector to detect ions exiting from said magnetic field, the intensity of the deflecting magnetic field being variable, the improvement wherein:

at least one electrostatic quadrupole lens is positioned be-




tween said slit and said magnetic field to give a converging property to said ion beam in a direction vertical to the median plane thereof and a diverging property in a direction radial thereto.

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**4,480,188**

## METHOD AND DEVICE TO DETERMINE INTERPLANAR DISTANCES IN ELECTRON DIFFRACTION IMAGES

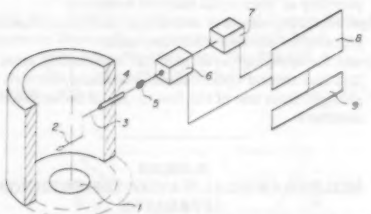
**André L. Tenuta de Azevedo, Ipatinga, Brazil, assignor to Usinas Siderurgicas De Minas Gerais S.A. -Usiminas, Belo Horizonte, Brazil**

**Filed Jul. 26, 1982, Ser. No. 402,044**

**Claims priority, application Brazil, Dec. 29, 1981, 8108474**

**Int. Cl.³ G01N *23/00***

**U.S. Cl. 250—306** **1 Claim**




1. Means for determining interplanar distances in electron diffraction images to be used in a transmission electron microscope, comprising a beam stopper including a rod, said rod having a tip, means on said rod for moving it linearly and rotationally, said rod including an extension, an electronic translation meter connected to said rod extension, an electronic rotation angle meter also connected to said rod extension, a microprocessor connected to each of said meters to continuously process signals therefrom whereby it is possible to determine the interplanar distance and angular relations of electron diffraction by positioning the shadow of said beam stopper rod tip on each of the points of interest of the diffraction and the values provided by the meters being used with correction equations.

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**4,480,189**

## THERMOLUMINESCENCE DOSIMETER READER

**Shusaku Miyake, Odawara, and Norio Miura, Isehara, both of Japan, assignors to Kasei Optonix, Ltd.**

**Filed Nov. 18, 1982, Ser. No. 442,756**

**Claims priority, application Japan, Nov. 20, 1981, 56-186637; Feb. 23, 1982, 57-27656**

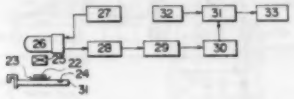
**Int. Cl.³ G01T *1/11***

**U.S. Cl. 250—337** **14 Claims**

1. A thermoluminescence dosimeter reader comprising a heating means for heating a thermoluminescence element, a light measuring circuit which converts the thermoluminescence emanating from the thermoluminescence element when it is heated into a first electric signal having a value depending

on the intensity of the thermoluminescence and outputs the first electric signal as a measured value of the dosage of radiation to which the thermoluminescence element is exposed, and a display device for displaying a reading of the dosage of radiation of the thermoluminescence element, wherein the improvement comprises

a dosage information inputting means which outputs a second electric signal having a value representing a predetermined reference dosage of radiation, a calculating means for calculating a calibration constant which is the ratio between the value of the second electric signal and the




value of the first electric signal which is the measured value of the dosage of radiation of a reference thermoluminescence element which is exposed to the predetermined reference dosage of radiation, a memory means for memorizing the calibration constant, and means for inputting into the display device the product of the value of the first electric signal obtained when a sample thermoluminescence element is measured and the calibration constant, whereby the display device displays the product as the reading of the dosage of radiation of the thermoluminescence element.

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**4,480,190**

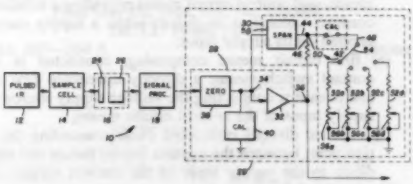
**NON-DISPERSIVE INFRARED GAS ANALYZER**

**Irvin G. Burough, Walnut Creek, and Kevin G. Williams, Pinole, both of Calif., assignors to Andros Analyzers Incorporated, Berkeley, Calif.**

**Filed May 20, 1982, Ser. No. 380,449**

**Int. Cl.³ G01N *21/17***

**U.S. Cl. 250—343** **10 Claims**




1. A non-dispersive gas analyzer comprising:

a gas cell for containing a gas mixture to be analyzed, said mixture including a selected one of a plurality of gases, each of said gases having the characteristic of absorbing radiant energy within a particular range of wavelengths;

means for directing pulse modulated radiant energy through said cell, the modulation being at a predetermined frequency;

detector means responsive to said radiant energy at a preselected wavelength for developing an AC signal having an amplitude determined by said radiant energy passing through said cell and a frequency corresponding to said predetermined frequency, said preselected wavelength being within said particular range of wavelengths for each of said gases;

means responsive to said AC signal for developing a DC signal having an amplitude determined from said AC signal; and

means for adjusting the amplitude of said DC signal in proportion to the relationship between the energy absorption of said selected one of said gases at said preselected wavelength and a reference amplitude to provide an adjusted DC signal proportional to the concentration of said selected one of said gases in said mixture.

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**4,480,191**

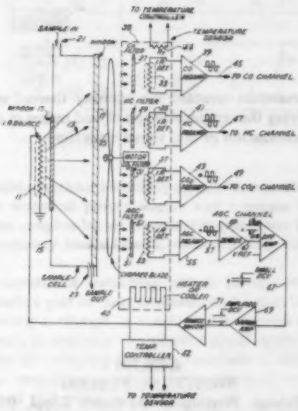
**AUTOMATIC GAIN CONTROL FOR AN INFRARED SOURCE OF AN AUTOMOTIVE EMISSIONS ANALYZER**

**Ihor B. Karpowycz, Chicago, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.**

**Filed Sep. 27, 1982, Ser. No. 424,083**

**Int. Cl.³ G01N *21/17***

**U.S. Cl. 250—343** **13 Claims**




1. An automatic gain control for driving a radiant energy source and controlling a constant energy emission for an automotive emission measurement system having a chopper means for chopping radiant energy passing from the source through a gas to be measured and onto a radiant energy detector, comprising:

a gain control filter for passing chopped radiant energy of preselected wavelengths;

radiant energy detector means positioned for receiving radiant energy passed by said control filter, said detector means generating a detector signal oscillating according to the chopping of the chopper means;

detector temperature controlling means for maintaining a temperature stable detector signal output of said radiant energy detector means, said detector temperature controlling means including detector temperature measuring means for monitoring the relative temperature of said radiant energy detector means;

demodulation means for demodulating said detector signal and generating a demodulated D.C. signal;

comparator means for comparing said demodulated D.C. signal with respect to a reference signal level for generating an error signal; and

means responsive to the amplitude of said error signal for driving said infrared source.

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**4,480,192**

**OPTICAL PULSE CORRELATION MEASUREMENT**

**Georg F. Albrecht, and Gerard Mourou, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.**

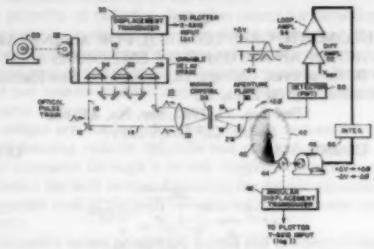
**Filed Feb. 16, 1982, Ser. No. 349,396**

**Int. Cl.³ G02B *27/42***

**U.S. Cl. 250—550** **15 Claims**

1. The method of measuring optical pulses which occur repetitively comprising the steps of generating an optical signal of varying intensity from said pulses corresponding to a auto-

correlation function of the intensity of said optical signal, detecting the intensity of said pulses, variably attenuating said



signal to maintain constant the intensity thereof as detected, and displaying the temporal shape of said pulses in accordance with the attenuation of said signal with time.

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**4,480,193**

## SWITCHING SYSTEM

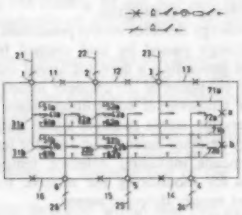
**Leopold Blahous, Wettingen, and Georg Köppl, Birr, both of Switzerland, assignors to BBC Brown Boveri & Company, Limited, Baden, Switzerland**

**Filed Jun. 9, 1983, Ser. No. 502,550**

**Claims priority, application Switzerland, Jun. 30, 1982, 3994/82**

**Int. Cl.³ H02B *01/24*; H02H *3/26*; H02J *4/00***

**U.S. Cl. 307—19** **5 Claims**



**1.** A switching system, comprising:

a plurality of nodes;

interruptable current branches which, when closed, connect said nodes in the form of a ring; and

at least two bridge branches for connecting each of said nodes to at least two other nodes, each of said bridge branches including

a first group of isolating switches each having a first contact and a second contact, said first contact being connected to one of said nodes,

a second group of isolating switches each having a first contact and a second contact, said first contact being connected to another one of said nodes, and

a circuit breaker having two terminals respectively connected to said second contacts of said first group of switches and said second contacts of said second group of switches.

**4,480,194**

## CIRCUIT FOR SUPPLYING A CONTROL CONTACT WITH POWER AND APPLICATION THEREOF TO THE CONTROL OF A REST TIME DELAY OF A RELAY

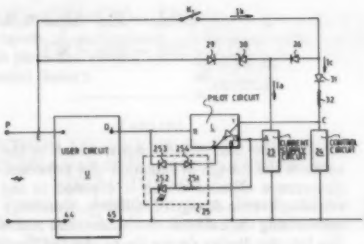
**Philippe Barthelemy, Le Vesinet; Gilles Baurand, Montesson, and Francois Roussel, Corneilles En Parisis, all of France, assignors to La Telemecanique Electrique, France**

**Filed Feb. 14, 1983, Ser. No. 466,192**

**Claims priority, application France, Feb. 12, 1982, 82 02356**

**Int. Cl.³ H01H *47/00***

**U.S. Cl. 307—132 E** **5 Claims**




**1.** A circuit arrangement comprising:

(a) a user circuit;

(b) power supply circuit means for power supplying the user circuit, said supply circuit means comprising a voltage supply source and pilot circuit means to switch on and off the power supply of the user circuit from said source, said pilot circuit means having a current supply input and a control input;

(c) current supply circuit means having a supply input and an output connected to the current supply input of the pilot circuit means, said current supply circuit providing a substantially constant current at its output when a supply current is applied on its supply input

(d) control circuit means having a supply input and an output connected to the control input of the pilot circuit means, said control circuit means providing a substantially constant voltage at its output when a supply current is applied on its supply input;

(e) first circuit means comprising, connected in series: contact switch means, a directly connected first diode, and a resistor connecting the voltage supply source to the supply input of the control circuit means;

(f) a second directly connected diode connecting the junction point between the contact switch means and the first diode to the supply input of the current supply circuit means and

(g) second circuit means comprising, connected in series: a third directly connected diode, and a reversely connected Zener diode connecting the voltage supply source to the junction point between the second diode and the supply input of the current supply circuit means.

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**4,480,195**

## AUTOMATIC SHUT-OFF DEVICE OF A RECORDING APPARATUS

**Akira Sawaki, and Hiromi Nozaki, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Dec. 27, 1982, Ser. No. 453,284**

**Claims priority, application Japan, Dec. 31, 1981, 56-213084**

**Int. Cl.³ H01H *9/54***

**U.S. Cl. 307—140** **2 Claims**

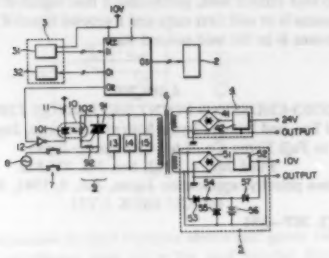
**1.** An automatic shut-off device for shutting off a power source in an apparatus such as a copying machine, comprising:

charging means connected to the power source for charging a battery;

control means for providing a first signal for an On-state,

and a second signal for an automatic shut-off state of said apparatus;

first means responsive to said ON-state signal for powering said apparatus and charging said battery;



second means responsive to said automatic shut-off state signal for electrically disconnecting the power source, and applying an output power from said battery to selected operational control functions during the period of said automatic shut-off state of said apparatus.

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**4,480,196**

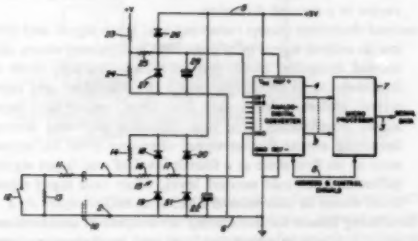
**INPUT PROTECTION CIRCUITS FOR INTEGRATED CIRCUIT DEVICES**

**Lorne C. Hinz, and David R. Whiting, both of Nepean,, Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed May 21, 1982, Ser. No. 380,608**

**Int. Cl.³ H03K *17/60***

**U.S. Cl. 307—200 A** **11 Claims**



1. A circuit arrangement comprising an integrated circuit device two supply voltage lines connected to said device for supplying respective predetermined supply voltages thereto, and a protection circuit connected between an input terminal and an input of said device, the protection circuit comprising a first resistor connected between the input terminal and a junction point, a first clamping diode connected between the junction point and one of said supply voltage lines, a second resistor coupled between the junction point and the device input, and a second clamping diode connected between the device input and said one of said supply voltage lines, each of said diodes being poled to be reverse-biased in response to voltages between said supply voltages being applied to said input terminal.

**4,480,197**

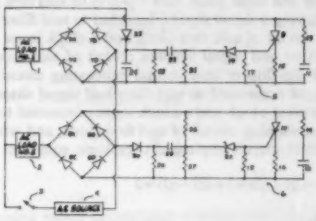
**MULTIPLE LOAD SWITCHING CIRCUIT**

**Jerrell P. Hollaway, 1330 Meadowbrook Rd. NE., Palm Bay, Fla. 32905**

**Continuation-in-part of Ser. No. 160,444, Jun. 17, 1980, abandoned. This application Jun. 16, 1981, Ser. No. 274,283**

**Int. Cl.³ H03K *17/72, 17/94***

**U.S. Cl. 307—252 N** **14 Claims**



1. A bistable thyristor switching circuit for use with a system having an electrical power source and a means for power interruption coupled by an electrical transmission line to one or more remotely located loads, said switching circuit comprising:

(a) semiconductor switching means having regenerative feedback, a pair of main terminals, and a gate terminal for producing a change in conductance between said main terminals in response to a control signal applied thereto:

(b) means for coupling the main terminals of said semiconductor switching means in series between a respective load and said power source;

(c) capacitor memory means for storing information representative of the most recent state of conduction of said semiconductor switching means; and

(d) voltage regulator trigger means, coupled to said memory means and to said series coupling means, for generating a control signal for the gate terminal of said semiconductor switching means in response to a momentary interruption of the supply of power through said series coupling means, where said means for power interruption is remote from the bistable thyristor switching circuit.

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**4,480,198**

**DEVICE FOR INCREASING THE OPERATIONAL SECURITY OF A DUPLICATED CLOCK**

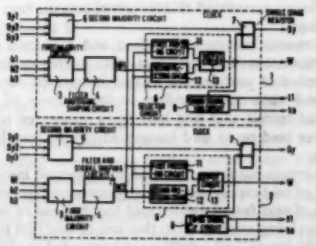
**Raymond Gass, Bolsenheim, France, assignor to La Telephonie Industrielle et Commerciale Telic Alcatel, Strasbourg, France**

**Filed May 20, 1982, Ser. No. 380,313**

**Claims priority, application France, May 20, 1981, 81 10022**

**Int. Cl.³ H03K *3/00, 19/003***

**U.S. Cl. 307—269** **3 Claims**



1. A device for increasing the operational security of a duplicated clock which comprises identical first and second clocks, each of which includes a majority logic circuit receiving a

respective clock signal from each of three timebases the generating a majority clock signal, and a filter and signal shaping circuit receiving said majority clock signal and producing a reconstituted clock signal, said device comprising in each clock a selector circuit which includes identical first and second processing circuits and an output circuit which has a respective input connected to each of said processing circuits, each of which has a respective input connected to the filter and signal shaping circuit of each clock and each of which includes a flip-flop and logic gates, said flip-flop of said first processing circuit having a signal input connected to said filter and signal shaping circuit of said first clock and a clock input connected to said filter and signal shaping circuit of said second clock, and said flip-flop of said second processing circuit having a signal input connected to said filter and signal shaping circuit of said second clock and a clock input connected to said filter and signal shaping circuit of said first clock, and wherein each said selector circuit implements the logic equation:

$$w=(q1+\overline{q2})\cdot w1+(\overline{q1}+q2)\cdot w2$$

in which:

w is a clock signal from the selector circuit,

w1 and w2 are the reconstituted clock signals produced by the first and second clocks, respectively,

q1 and $\overline{q1}$ are the direct and complemented output signals of said flip-flop of said first processing circuit, and

q2 and $\overline{q2}$ are the direct and complemented output signals of said flip-flop of said second processing circuit.

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**4,480,199**

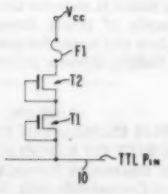
## IDENTIFICATION OF REPAIRED INTEGRATED CIRCUITS

**Ramesh C. Varshney, and Robert J. Strain, both of San Jose, Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.**

**Filed Mar. 19, 1982, Ser. No. 360,028**

**Int. Cl.³ H03K** *19/40;* **H02H** *7/20*

**U.S. Cl. 307—303** **15 Claims**




1. Apparatus for providing an identification signal indicative of the presence or absence of a feature in an integrated circuit having an integrated circuit lead which has a selected range of operating potentials applied to it and having a a first power lead for being connected to a potential source, said apparatus comprising:

fusing means having a first lead and a second lead, said fusing means having a first state corresponding to the presence of said feature in said integrated circuit and a second state corresponding to the absence of said integrated circuit, said first lead being connected to said first power lead or to said integrated circuit lead but not to both;

circuit means having a first lead and a second lead, said first lead of said circuit means being connected to said second lead of said fusing means, said second lead of said circuit means being connected to that one of said first power lead or said circuit lead which is not connected to said first lead of said fusing means;

said fusing means and said circuit means operating as an open circuit when said potential source is connected to said first power lead and a potential from said selected range of operating potentials is applied to said integrated circuit lead;

said fusing means and said circuit means, when said potential source is connected to said first power lead and a potential not in said selected range of operating potentials is applied to said circuit lead, producing a first signal if said fusing means is in said first state and a second signal if said fusing means is in the said second state.

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**4,480,200**

## ZERO-CROSSING POINT DETECTION CIRCUIT

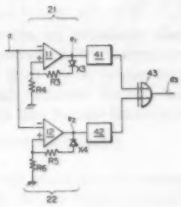
**Yoichi Tan, and Fumio Miyao, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan**

**Filed Jan. 4, 1982, Ser. No. 336,812**

**Claims priority, application Japan, Jan. 8, 1981, 56-1350**

**Int. Cl.³ H03K** *5/153*

**U.S. Cl. 307—354** **9 Claims**




1. A level-crossing point detection circuit for receiving an input signal having a level which varies on either side of a reference level and providing an output signal representing crossings of said input signal through said reference level, said circuit comprising:

first detection means receiving said input signal and having an output signal of at least first and second states, said first detection means output changing from its first state to its second state at a first level of said input signal when said input signal level varies in a first direction and said first detection means output signal changing from its second state to its first state at a second level of said input signal different from said first level when said input signal level varies in a second direction;

second detection means receiving said input signal and having an output signal of at least first and second states, said second detection means output signal changing from its first state to its second state at a third level of said input signal, different from said first level, when said input signal level varies in a first direction and said second detecting means output signal changing from its second state to its first state at a fourth level of said input signal, different from said second level, when said input signal level varies in said second direction; and

combining means for combining the outputs of said first and second detection means to obtain said level-crossing point detection circuit output.

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**4,480,201**

## DUAL MODE POWER TRANSISTOR

**James R. Jaeschke, Waukesha, Wis., assignor to Eaton Corporation, Cleveland, Ohio**

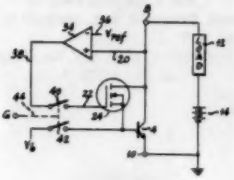
**Filed Jun. 21, 1982, Ser. No. 390,486**

**Int. Cl.³ H03K** *17/04, 17/12, 17/68, 17/687*

**U.S. Cl. 307—570** **26 Claims**

1. A dual mode power transistor circuit having a saturation mode and an active region mode for optimizing ON state power dissipation, base drive requirements, and switching speed in applications subject to large overload currents for short periods of time, comprising:

a bipolar power transistor biased by base drive means into saturation for normally low level load currents less than a given value therethrough between a pair of main power terminals connectable to a power source through a load, the emitter and collector of said transistor being connected to respective said main terminals; and



means responsive to load currents above said given value to supply additional base drive for said bipolar transistor while also keeping said bipolar transistor in its active region, out of saturation, to enable fast turnoff.

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4,480,202

## MAGNETIC LINEAR DRIVE

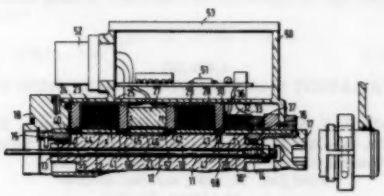
**Volkmar Leutner, Friolzheim; Hans J. Haase, Stuttgart; Dietmar Meier, Tiefenbronn; Roland Schempp, Vaihingen, and Berthold Pfuhl, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Mar. 1, 1983, Ser. No. 471,144**

**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207912**

**Int. Cl.³ H02K *41/00***

**U.S. Cl. 310—12** **5 Claims**



1. A magnetic linear drive, particularly for use in connection with valve sliders, comprising a tubular pressure-resistant guiding body; an armature arranged for axial displacement within said guiding body; at least two solenoid coils mounted on said guiding body to induce an adjustable magnetic flux in said armature; a permanent magnet arranged on said guiding body in the magnetic circuit of said solenoid coils to induce a permanent magnetic flux in said armature; said two solenoid coils being mounted in an axially spaced relationship and said permanent magnet being arranged between said coils; each of said solenoid coils being provided with lateral conducting members and the outer surface of said tubular guiding body being formed with annular recesses facing the ends of said conducting members, said recesses being filled with a magnetically conductive material forming magnetic poles, and said armature being formed with flanges cooperating with said poles.

4,480,203

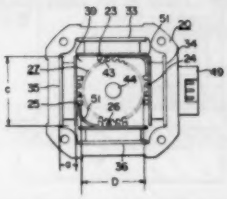
## STEPPING MOTOR

**Toshiyasu Takura, Hino; Tsuneaki Okada, Kawasaki, and Eiji Kaneko, Tokyo, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 30, 1982, Ser. No. 454,667**

**Int. Cl.³ H02K *37/00***

**U.S. Cl. 310—42** **5 Claims**



1. A stepping motor comprising: a rectangular stator core in the shape of a substantially square frame having in the center of each of the inner side edges of the sides thereof the corresponding one of a plurality of poles each having at the end thereof a plurality of projections formed according to a step angle; four coils wound on bobbins fitted on said poles of said stator core and disposed along said inner side edges of said sides of said stator core, respectively; and a rotor disposed in the space surrounded by said coils and having projections formed on the peripheral surface thereof according to said step angle corresponding to said plurality of projections of said poles, wherein the height of each of said poles is made 0.24 to 0.5 times as much as the outside diameter of said rotor, the thickness of each of said bobbins being substantially equal to the distance between a line extending from the end of the corresponding one of said poles and perpendicular to the projecting direction thereof, and the adjacent side edge of the pole adjacent to said corresponding one of said poles, and the width of each of said bobbins being substantially equal to the value obtained by subtracting a value twice as large as the thickness of each of said bobbins from the distance between the inner side edges of said sides of said stator core facing each other.

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4,480,204

## APPARATUS FOR THE CONTACTLESS AND BRUSHLESS TRANSMISSION OF MEASURING AND CONTROL SIGNALS

**Heinrich Küter, deceased, late of Bochum, Fed. Rep. of Germany by Gerda Küter, Marlies Küter, Albert Küter, Rudolf Küter, heirs, and Jürgen Klaar, Neukirchen-Vluyn, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany**

**Filed Feb. 22, 1983, Ser. No. 468,555**

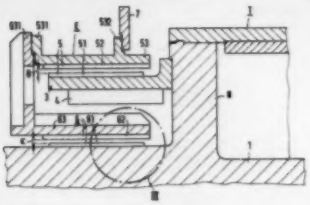
**Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206338**

**Int. Cl.³ H02K *11/00***

**U.S. Cl. 310—68 R** **7 Claims**

1. Apparatus for the contactless and brushless transmission of measuring and control signals by generators with rotating rectifier or thyristor excitation, comprising a shaft having an outer surface, a driving collar integral with said shaft, a shrouding ring lying at ground potential being integral with said driving collar and rotationally fixed relative to said shaft, said shrouding ring having a given axial range and an outer surface, a first and a second inductive signal transmission apparatus each including respective stationary and rotating parts, said second signal transmission apparatus being disposed concentrically within said first signal transmission apparatus in said given axial range of said shrouding ring, said rotating part of said first signal transmission apparatus being disposed on said outer surface of said shrouding ring, said rotating part of said second signal transmission apparatus being disposed on

said outer surface of said shaft, a machine housing, a support cylinder being supported by said machine housing and having an inner surface, said stationary part of said first signal transmission apparatus being disposed on said inner surface of said support cylinder, another support cylinder being supported concentrically in said first-mentioned support cylinder and



having an inner surface, said stationary part of said second signal transmission apparatus being disposed on said inner surface of said other support cylinder, and two flanges each being disposed on a respective one of said support cylinders, said flanges being connected to each other outside said given axial range of said shrouding ring.

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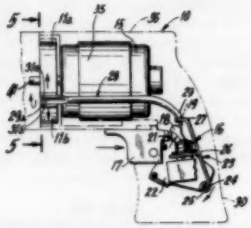
4,480,205

## AUTOMATIC BRAKE CONTROL FOR ROTARY ELECTRIC TOOLS

Svend Nymann, 68 E. Hartsdale Ave., Hartsdale, N.Y. 10530

Filed Nov. 14, 1983, Ser. No. 550,826
Int. Cl.³ H02K 7/10
U.S. Cl. 310—77 4 Claims



1. In a rotary electric tool having a motor with a rotating armature, a fan, and a brake drum mounted on the fan within a housing, an automatic brake control device comprising:

a pair of curved brake shoes slidably mounted at one end about the brake drum and each brake shoe having a projecting portion at one end extending outwardly from the brake drum and in a substantially parallel spaced relation forming a striker plate and a sloping face at the other end,

an anchor plate mounted to the housing and having a recess at each end which is slidably engaged by the sloping face of a corresponding brake shoe,

spring means normally biasing the brake shoes into engagement with the brake drum,

an elongated linkage element having a cam portion mounted between the projecting portions of the striker plate of the brake shoes at one end and a curved portion having a coupling aperture at the other end,

a reciprocable trigger mounted for movement in the housing of said tool,

means for activating the motor comprising switch means activated by the trigger, and,

linkage means mounted within the housing and connected to the trigger to simultaneously actuate the enlongated linkage element camming the brake shoes outwardly against the bias of the spring means thereby releasing the brake drum and associated fan upon operation and wherein the armature is immediately halted when the trigger is released as the spring means drive the brake shoes into engagement with the brake drum.

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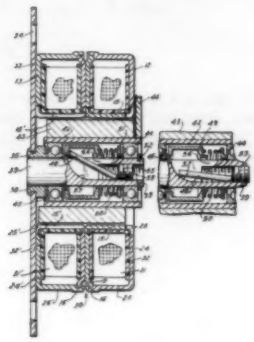
4,480,206

## MOTOR HAVING STATIONARY SHAFT AND METHOD OF ASSEMBLING IT

Harry G. Manson, Princeton, Ind., assignor to IMC Magnetics Corp., Jericho, N.Y.

Filed Mar. 8, 1982, Ser. No. 356,060
Int. Cl.³ H02K 5/16
U.S. Cl. 310—90 10 Claims



1. An electric motor comprising:

a stationary support,

a shaft fixed at one end to the support and projecting in cantelever fashion therefrom, the shaft being at least partially hollow,

an annular rotor surrounding the shaft,

a pair of bearings between the rotor and the shaft for rotatably supporting the rotor, and

a locking member extending from within the hollow interior of the shaft into operative engagement with one of the bearings for locking the bearing with respect to the shaft.

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4,480,207

## PERMANENT MAGNET ROTOR AND METHOD OF MAKING SAME

Timothy J. E. Miller, Schenectady; Donald W. Jones, Burnt Hills, and Gary L. Kalan, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,666
Int. Cl.³ H02K 21/12
U.S. Cl. 310—156 8 Claims

1. A rotor for a permanent magnet machine comprising:

a north and a south arcuately shaped pole piece;

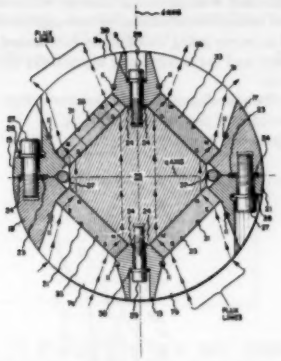
four nonmagnetic segments, two of said segments secured to either end of the north pole piece forming a half ring and two of said segments secured to either end of the south pole piece forming another half ring;

a shaft of magnetic material having a central portion with a substantially rhombic cross section;

means for securing said half rings around said central portion of said shaft, the centerline of said half rings aligning with the diagonal of said substantially square central portion of said shaft, the major sides of said shaft and the inner faces of said half rings forming a rigid structure with four apertures extending the axial length of pole pieces;

four magnets, each magnet positioned in one of said apertures, respectively, two of said magnets having their north seeking face adjacent the north pole piece and two of said

magnets having their south seeking face adjacent the south pole piece; and



means for securing said magnets in their respective apertures.

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4,480,208

## STATOR STRUCTURE FOR AN ELECTROMAGNETIC DEVICE

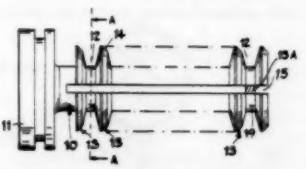
Frank M. Logie, London, and Ronald Phillips, Northolt, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 30, 1982, Ser. No. 430,673

Claims priority, application United Kingdom, Oct. 23, 1981, 8132015

Int. Cl.³ H02K 1/18

U.S. Cl. 310—194 3 Claims



1. A stator structure for an electromagnetic device comprising: a core of cylindrical form having a plurality of circumferential grooves defined therein, adjacent grooves defining a pole piece therebetween, windings located in the grooves, the direction of electric current flow in the adjacent windings in use, being in the opposite direction so that adjacent pole pieces will assume opposite magnetic polarity, and a slot extending diametrically across the core throughout its length with winding wire extending from one winding to an adjacent winding across a pole piece to connect adjacent windings extending through the core via said slot so that adjacent windings can be wound sequentially without the wire occupying space in the grooves as it traverses a pole piece and a connecting wire is not located in a groove as it traverses a pole piece.

4,480,209

## SURFACE ACOUSTIC WAVE DEVICE HAVING A SPECIFIED CRYSTALLINE ORIENTATION

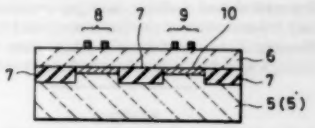
Takeshi Okamoto; Ryuichi Asai, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,483

Claims priority, application Japan, Oct. 9, 1981, 56-160062; Oct. 12, 1981, 56-163148

Int. Cl.³ H01L 27/20; H03H 9/42

U.S. Cl. 310—313 B 8 Claims




1. A surface acoustic wave device, comprising a silicon substrate having a main surface which has a predetermined crystalline orientation and has first and second portions; a layer of a dielectric provided on said first portion of said main surface of said substrate; a layer of zinc oxide provided on said dielectric layer and on said second portion of said main surface of said silicon substrate; and plural electrodes provided on said zinc oxide layer, electrical excitation of said electrodes causing a surface acoustic wave to propagate along a predetermined crystalline axis of said silicon substrate.

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4,480,210

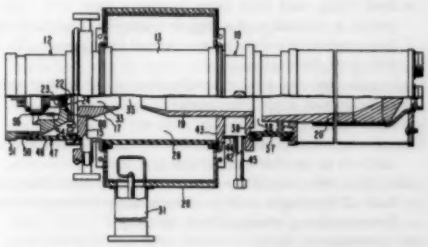
## GRIDDED ELECTRON POWER TUBE

Donald H. Preist, San Mateo, and Merrald B. Shrader, Los Altos, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 12, 1982, Ser. No. 377,498

Int. Cl.³ H01J 25/00

U.S. Cl. 315—4 75 Claims



1. A linear-beam vacuum tube having a longitudinal axis for use with inductive-circuit output means, and means providing an axial magnetic field, said tube comprising:

an axially centered electron gun assembly at one end of said tube having a thermionic cathode and an anode spaced therefrom, said anode and cathode operable at a minimum several kilovolts DC electrical potential therebetween to form and accelerate along said axis an electron beam;

an axially centered grid comprising a temperature-resistant form of carbon between said cathode and anode, closely spaced a predetermined distance from said cathode, and accepting a high frequency control signal to density modulate said beam;

low impedance signal input means for supplying both said high frequency control signal to said grid, and said DC electrical potential to said cathode;

means associated with said signal input means for supporting said grid to accommodate relative expansion while accu-

rately maintaining said predetermined grid-cathode distance;

axial collector means at the other end of said tube for accepting and dissipating therein the electrons of said beam remaining after transit across said tube; and

axial drift tube means enclosing said beam and extending between said gun assembly and collector, said tube means including a first portion and a second portion, both said tube portions being elongated relative to their diameters, the internal diameter of at least said first portion being substantially uniform, a gap being defined between said first and second portions, said gap communicating with said inductive-circuit output means, said magnetic field focusing and confining said beam from said cathode through said drift tube means at least to said gap.

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**4,480,211**

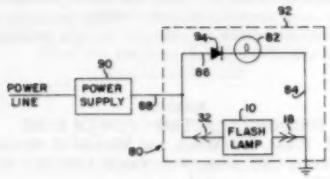
## FLASH LAMP AND CIRCUITRY FOR USE WITH AN INCANDESCENT LIGHT

**Fredrick W. Eggers, Palos Heights, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.**

**Continuation-in-part of Ser. No. 376,752, May 10, 1982,. This application Apr. 6, 1983, Ser. No. 482,603**

**Int. Cl.³ H01J** *7/44, 17/34, 19/78, 29/96*

**U.S. Cl. 315—70** **4 Claims**




1. A flash lamp and incandescent lamp assembly which comprises:

a flash lamp, said flash lamp having a flash tube with an anode, a cathode and a trigger electrode, said flash lamp being operable to rely on an external timing circuit for the timing of the flashes;

a transformer and capacitor circuit coupled to said anode, cathode and trigger electrode;

a multi-contact lamp base;

means connecting said anode to one base contact and said cathode to another base contact;

said flash tube, transformer and capacitor circuit and said base all forming a unitary, integral lamp without the need for any timing means within the lamp;

an incandescent lamp;

a power supply for supplying power to both said flash tube and said incandescent lamp, with the outlet of the power supply providing energy for both the incandescent lamp and the flash lamp;

a diode having an anode and a cathode;

means connecting said diode between said power supply outlet and said incandescent lamp.

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**4,480,212**

## EXTENDED LIFE INCANDESCENT LAMP WITH SELF CONTAINED DIODE AND REFLECTOR

**Russell Monahan, Ypsilanti, and Kevin J. Keating, Birmingham, both of Mich., assignors to Diolight Technology, Inc. Bloomfield Hills, Mich.**

**Filed Jun. 14, 1982, Ser. No. 387,737**

**Int. Cl.³ H01K** *1/62*

**U.S. Cl. 315—71** **6 Claims**

1. In an incandescent lamp of the type comprising:

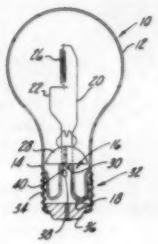
a glass envelope including a bulb portion, a neck portion and a stem,

a screw base including a metal sleeve, an insulating base plug therein and a metal center contact in the insulating plug,

a pair of lead-in wires extending through the stem, one of the lead-in wires being electrically connected to said center contact and the other being electrically connected to said sleeve,

a wire filament disposed within said envelope and connected between said pair of lead-in wires,

the improvement comprising:




a diode electrically connected bewtween one of said lead-in wires and one of said base contacts and being disposed in said neck portion of the envelope adjacent said base,

and a reflector supported on said stem adjacent the junction of said bulb portion and said neck portion and substantially closing the passageway between the bulb portion and the neck portion for reducing convection currents therebetween whereby heat loss through said base is reduced, said reflector being disposed between said diode and said filament whereby said diode is shielded from the heat of said filament for operation at reduced temperature.

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**4,480,213**

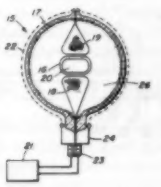
## COMPACT MERCURY-FREE FLUORESCENT LAMP

**Walter P. Lapatovich, Watertown; George R. Gibbs, Marlboro, and Joseph M. Proud, Wellesley Hills, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Jul. 26, 1982, Ser. No. 401,528**

**Int. Cl.³ H05B** *41/16, 41/24*

**U.S. Cl. 315—248** **9 Claims**




1. A fluorescent lamp comprised of:

a sealed glass envelope;

a sealed capsule supported within said envelope;

said capsule containing a mercury-free fill including aluminum trichloride;

means for vaporizing said aluminum trichloride to a pressure of approximately 1 torr;

means for energizing said fill into a plasma discharge to produce a diatomic AlCl emission of ultraviolet light in a band near 261.4 nm; and

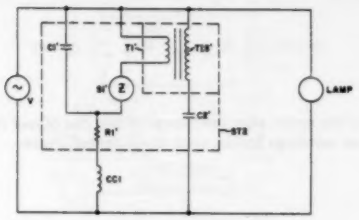
a phosphor deposed between the inner surface of said glass envelope and said capsule for converting ultraviolet light emitted from said discharge into visible light.

4,480,214

## STARTER CIRCUIT FOR GASEOUS DISCHARGE LAMP

Gregory L. Sodini, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,262
Int. Cl.³ H05B 41/14
U.S. Cl. 315—290 14 Claims



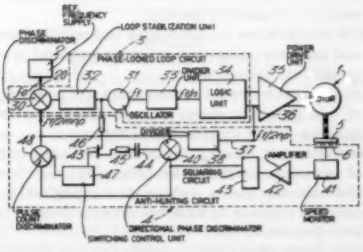

1. A starter for a gaseous discharge lamp adapted to be powered across the two conductors from an alternating current source, the starter circuit being connected across the two conductors in parallel with said lamp, said starter circuit including a first and second path both in parallel across the source, said first path including a series resistance-capacitance network in which there is a choke coil in series resistance with the resistance of said resistance capacitance network and further with the combination of a voltage threshold sensitive switch and pulse transformer primary in parallel with the capacitance of said network, said switch being adapted to close a circuit to the primary of the transformer when the threshold voltage of the switch is reached by the network, and said second path including the secondary of said pulse transformer coupled across said two conductors for transmitting high voltage, high frequency pulses to said lamp to start said lamp, with said pulse transformer having a turns ratio of approximately one to thirty to generate high voltage, high frequency starting current from said transformer secondary for starting said lamp.

4,480,215

## SYNCHRONOUS ELECTRIC MOTOR CONTROL SYSTEMS

Anton M. Bax, Forthampton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 18, 1982, Ser. No. 434,810
Claims priority, application United Kingdom, Oct. 27, 1981, 8132287
Int. Cl.³ G05B 5/00
U.S. Cl. 318—306 9 Claims



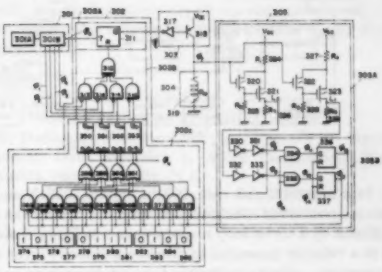

1. A control system for a synchronous electric motor comprising: a phase-locked loop circuit having an oscillator with an output and an input, the frequency of the output of said oscillator being dependent on a signal at its input, and drive means for producing a drive signal for said motor in response to the output of said oscillator; a feedback loop circuit connected intermediate the output of said drive means and the input of said oscillator whereby said feedback loop circuit derives a feedback signal from the drive signal supplied to said motor to control the frequency of said oscillator; and an anti-hunting circuit including monitor means that provides a speed signal in response to rotation of the rotor of said motor, first comparator means connected to receive said speed signal and said feedback signal, said first comparator means producing an output signal in accordance with any change in phase difference between said speed signal and said feedback signal, and means supplying said output signal from said first comparator means to the input of said oscillator in said phase-locked loop circuit so as to vary the input signal to the oscillator such as to reduce fluctuations in the speed of said motor.

4,480,216

## MOTOR DRIVING CIRCUITS

Fumio Nakajima, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,266
Claims priority, application Japan, Nov. 10, 1981, 56-180158
Int. Cl.³ G05B 5/00
U.S. Cl. 318—331 7 Claims



1. A motor driving circuit comprising:

a pulse generating circuit including a reference frequency oscillating circuit and a frequency dividing circuit connected to said reference frequency oscillating circuit, said frequency dividing circuit comprising a plurality of stages, and an output at the final stage of said frequency dividing circuit and outputs at the intermediate stages thereof generating plural types of pulse trains;

a modulation pulse generating circuit including a flip-flop circuit whose input is connected to the output at the final stage of said frequency dividing circuit and a reset pulse generating circuit some inputs of which are connected to the outputs at the intermediate stages of said frequency dividing circuits and whose output is connected to a reset terminal of said flip-flop circuit;

a semiconductor driving circuit connected to an output of said modulation pulse generating circuit for providing operating power to a motor winding; and

a detecting circuit connected to said semiconductor driving circuit for detecting a voltage induced in said motor winding, said detecting circuit including means for setting a reference level, detecting the voltage induced in said motor winding in accordance with said reference level during the time said semiconductor driving circuit is non-conducting and sending a control signal for regulating a next produced modulation pulse width to said modulation pulse generating circuit corresponding to said detected voltage, input circuits of said means being formed of metal oxide semiconductor transistors which have high input impedance,

said flip-flop circuit being set by the output at the final stage

of said frequency dividing circuit and said reset pulse generating circuit generating a reset pulse when the outputs at the intermediate states of said frequency dividing circuit match a value determined by the control signal given by said detecting circuit,

whereby said modulating pulse generating circuit shapes said modulation pulse from said plural types of pulse trains of said pulse generating circuit in accordance with said control signal so as to drive said motor uniformly.

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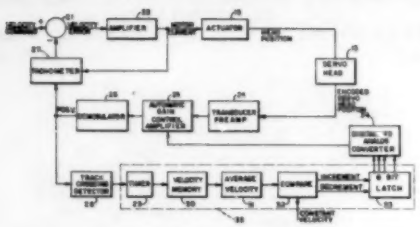
**4,480,217**

## AUTOMATIC VELOCITY CALIBRATOR FOR A VELOCITY SERVO LOOP IN A MAGNETIC DISK DRIVE

**David C. Robbins, Jefferson County; David Haldeman, Denver; John P. Hill, Adams County; Charles Sander, and James Touchton, both of Boulder County, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.**

**Filed Dec. 14, 1982, Ser. No. 449,735**
**Int. Cl.³ G05B *5/01***
**U.S. Cl. 318—618** **18 Claims**



1. In a magnetic disk drive of the type in which magnetic heads are positioned over tracks on magnetic disks by an actuator driven by a servo loop responsive to a velocity transducer and to a velocity command to produce a velocity error signal, an automatic velocity calibrator for said servo loop comprising:

means for measuring the velocity of said actuator between at least two tracks on one of said disks;

means for comparing the measured velocity to a constant velocity command;

means for changing the gain of said velocity transducer in response to the comparison; and

means for successively actuating said means for measuring, comparing and changing the gain of said velocity transducer as said actuator moves across successive tracks on said disks to calibrate said actuator velocity in a single pass of said heads across said tracks.

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**4,480,218**

## DIRECT DETECTION OF BACK EMF IN PERMANENT MAGNET STEP MOTORS

**Victor D. Hair, Mint Hill, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 29, 1983, Ser. No. 480,049**
**Int. Cl.³ H02K *29/04***
**U.S. Cl. 318—696** **12 Claims**

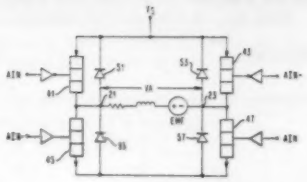
1. A step motor control comprising:

a supply voltage for the motor;

drive means connected to said supply voltage for orthogonally driving each of orthogonal low impedance windings of the motor;

means for causing the current in one of said orthogonal windings to decay rapidly to zero while another of said orthogonal windings is being driven by said drive means;

sensing means connected across said one of said orthogonal windings for directly sensing the voltage induced in said one of said orthogonal windings by the permanent magnet



of the motor after the current in said one of said orthogonal windings has decayed to substantially zero.

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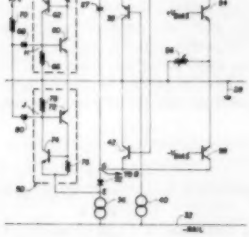
**4,480,219**

## PHASE-TO-VOLTAGE CONVERTER

**Peter W. Shackle, Melbourne, and Robert S. Pospisil, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Filed Apr. 28, 1982, Ser. No. 372,812**
**Int. Cl.³ H02P *5/40***
**U.S. Cl. 318—729** **13 Claims**



1. A phase-to-voltage converter for a load comprising:

a first and second voltage means for providing positive and negative half cycles of the alternating current voltage used to drive said load, respectively;

capacitor means having positive and negative terminals connected respectively to said first and second voltage means to be charged thereby;

a first switch means for connecting said negative terminal of said capacitor means to a reference potential in response to said first voltage means;

a second switch means for connecting said positive terminal of said capacitor means to said reference potential in response to said second voltage means;

first terminating means connected to said positive terminal of said capacitor means for terminating the charging of said capacitor means without discharging said capacitor means in response to a current reversal through said load from positive to zero;

second terminating means connected to said negative terminal of said capacitor means for terminating the charging of said capacitor means without discharging said capacitor means in response to a current reversal through said load from negative to zero;

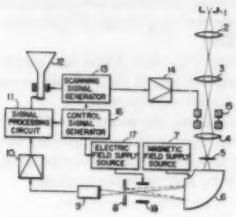
the voltage across said capacitor means representing the phase relationship of said voltage and current of said load.

4,480,220

## ELECTRON ENERGY ANALYZING APPARATUS

Shigeto Isakozawa, and Morioki Kubozoe, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,404
Claims priority, application Japan, Nov. 10, 1980, 55-157008
Int. Cl.³ G01N 27/00
U.S. Cl. 324—71.3 12 Claims




1. An electron energy analyzing apparatus comprising:

means for generating an electron beam;

means for two-dimensionally scanning a sample with the electron beam;

means for dispersing electrons transmitted through the sample on scanning the sample with the electron beam in accordance with the energy level of the transmitted electrons;

means for deflecting the dispersed electrons of different energy levels so that the dispersed electrons of different energy levels are detectable separately when the electron beam scans each scanning position on the sample, said different energy levels including at least a selected energy level related to an energy loss peak characterizing a predetermined substance contained in the sample;

means for separately detecting the dispersed electrons of different energy levels and for producing output signals corresponding to the dispersed electrons of respectively different energy levels, said output signals including background components;

means for detecting a specific variation of the output signal corresponding to the dispersed electrons of said selected energy level as compared with the remaining output signals and for producing an electric signal when said specific variation is detected, said specific variation being a variation as detected when the predetermined substance is contained in the sample at the scanning portion thereof; and

means for displaying a distribution image of the predetermined substance by using the electrical signal for each scanning position on the sample.

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4,480,221

## LEVEL METER CIRCUIT

Kazuo Shozima, Tokyo, Japan, assignor to Trio Kabushkik Kaisha, Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,221
Claims priority, application Japan, Aug. 14, 1980, 55-115473[U]
Int. Cl.³ G01R 31/00
U.S. Cl. 324—96 6 Claims

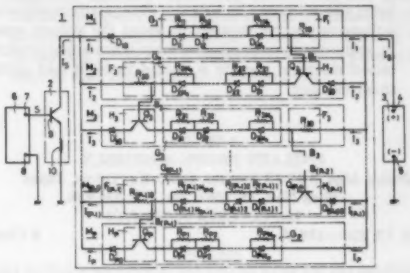
1. A level meter circuit comprising:

a parallel circuit of P unit circuits $M_1$, $M_2$, . . . $M_P$; and

main current control means connected in series with the parallel circuit and controlled by an input signal the level of which is to be displayed;

wherein the unit circuit $M_i$ (i = 1, 2, . . . P) has a diode circuit $G_i$, the diode ciruit $G_i$ having $N_i$ series-connected light emitting diodes $D_{i1}$, $D_{i2}$, . . . $D_{iNi}$ and current bypassing resistors $R_{i1}$, $R_{i2}$, . . . $R_{iNi}$ respectively connected in parallel with the light emitting diodes $D_{i1}$, $D_{i2}$, . . . $D_{iNi}$, and the current bypassing resistors $R_{i1}$, $R_{i2}$, . . . $R_{iNi}$ having smaller resistance values in this order;

wherein the unit circuits $M_1$ to $M_{(P-1)}$ respectively have current detecting circuits $F_1$ to $F_{(P-1)}$ which are connected in series with the diode circuits $G_1$ to $G_{(P-1)}$, respectively; and



wherein the unit circuits $M_2$ to $M_P$ respectively have current control circuits $M_2$ to $M_P$ which are connected in series with the diode circuits $G_2$ to $G_P$ respectively and controlled by the current detecting circuits $F_1$ to $F_{(P-1)}$ respectively.

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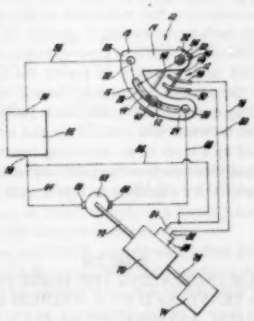
4,480,222

## ADJUSTABLE ELECTRICAL SHUNT

Carl K. Dudley, Petersburg, Mich., and Richard W. Mattson, Rossford, Ohio, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 13, 1982, Ser. No. 377,741
Int. Cl.³ G01R 1/20; H01C 5/00
U.S. Cl. 324—126 3 Claims



1. A current-sensing device, comprising:

an electrically conductive current shunt member adapted to be interposed in an electrical circuit;

a voltage-responsive member affixed to said current shunt member for providing an electrical output responsive to electrical current flowing through said current shunt member;

said current shunt member being a flat member including a first portion and a second arcuate portion;

said first portion having a first end portion and a second end portion, said second end being a free end and adapted to receive a first terminal of said voltage-responsive member;

said second portion having a first end and a second end, said second end being a free end and adapted to be connectd to said electrical circuit;

said first end of said first portion and said first end of said

second portion being coextensive and adapted to be connected to said electrical circuit;

said second portion defining an arcuate slot therein, said arcuate slot having a radius centered on said second end and having a slot width adapted to receive a second terminal of said voltage-responsive member;

said second terminal of said voltage-responsive member being slidable in said arcuate slot to angularly position said voltage-responsive member to adjust the voltage sensed by said voltage-responsive member when a first predetermined electrical current is passed through said current shunt member.

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**4,480,223**

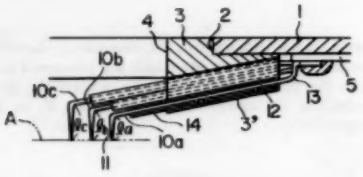
**UNITARY PROBE ASSEMBLY**

**Seiichiro Aigo, 3-15-13 Negishi, Daito-Ku, Tokyo, Japan**

**Filed Nov. 25, 1981, Ser. No. 324,836**

**Int. Cl.³ G01R** *31/02, 1/06*

**U.S. Cl. 324—158 P** **8 Claims**




1. A unitary probe assembly adapted to inspect semiconductor chips each provided with a plurality of electrode terminals at both an inner surface area and an outer peripheral edge thereof, comprising: a board defining an aperture therethrough; a block seated in said aperture and defining at least one opening therethrough; a plurality of probes each formed of electrically conductive fine wires and arranged aslant around said opening; each probe having a contact tip portion at one end and a terminal end portion at an opposite end; said probes being disposed in a plurality of layers through said block, extending at the contact tip portions thereof into said opening and terminating in a common plane; each probe having a main body portions between said contact tip and terminal end portions, covered by a layer of an insulating material; and a layer of an electrically conductive material convering said layer of insulating material for shielding each said main body portion of each probe.

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**4,480,224**

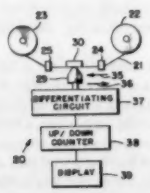
**SYSTEM FOR INDICATING THE DIRECTION AND NET DISTANCE TRAVELLED BY A MEDIUM CONTAINING A PERIODIC ASYMMETRICAL FLUX PATTERN**

**Ralph Kricker, 225 W. Walk, West Haven, Conn. 06516**

**Filed Dec. 21, 1981, Ser. No. 332,549**

**Int. Cl.³ G01B** *7/14*

**U.S. Cl. 324—207** **3 Claims**




1. A system for indicating the net distance and direction travelled along a predetermined path by a magnetic recording medium,

(a) a periodic asymmetrical flux pattern located on said medium for movement past a position on said predetermined path when said medium is moved;

(b) single sensor means responsive to movement of said flux pattern past said position for producing first signals in response to passage of said flux pattern in a first direction and for producing second signals differing from said first signals in response to passage of said flux pattern in a second direction;

(c) means responsive to each of said first signals for generating a positive pulse and to each of said second signals for generating a negative pulse; and

(d) means for counting the positive and negative pulses to net an algebraic sum, said sum providing an indication of the direction and net distance travelled along said predetermined path by said movable medium.

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**4,480,225**

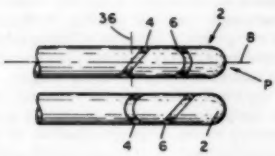
**IMPROVED MULTI-DIRECTIONAL EDDY CURRENT INSPECTION TEST APPARATUS FOR DETECTING FLAWS IN METAL ARTICLES**

**Roy A. Nance, McMurray; William H. Hartley, and Alfred J. Caffarel, both of Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 11, 1982, Ser. No. 347,759**

**Int. Cl.³ G01N** *27/82;* **G01R** *33/12*

**U.S. Cl. 324—238** **11 Claims**




1. An eddy current inspection apparatus comprising a body having an axis,

first and second coils disposed about said body spaced axially one from the other,

said first coil lying in a first plane intersected by said axis to form a first acute angle therewith,

said second coil lying in a second plane intersected by said axis to form a second acute angle therewith, said first and second planes being nonparallel one to the other and intersect each other at an angle of about 60° and said first and second acute angles having different angular positions about said axis.

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**4,480,226**

**APPARATUS FOR INDICATING THE DIRECTION OF A VEHICLE WITH ABNORMAL FIELD SENSING CIRCUITS**

**Akira Kuno, Ohbu; Muneaki Matsumoto, Okazaki, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Sep. 5, 1980, Ser. No. 184,615**

**Claims priority, application Japan, Sep. 12, 1979, 54-126607[U]; Nov. 6, 1979, 54-159561[U]; Mar. 12, 1980, 55-32695[U]**

**Int. Cl.³ G01R** *33/02, 33/04;* **G01C** *17/28*

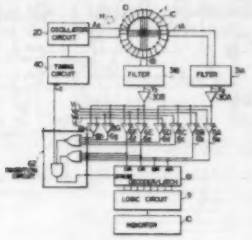
**U.S. Cl. 324—247** **12 Claims**

1. In a heading indicating apparatus for vehicles including direction-finding sensor means having a magnetic core, an excitation winding wound on said core and a pair of output windings wound to cross each other at right angles on said

core for generating heading indicating output signals in response to terrestrial magnetism, the improvement comprising:

means for classifying the output signal generated from each of said output windings into predetermined (N+1) signal level regions to generate classifying signals;

means for indicating one of 4N headings indicative of the



direction of said sensor in response to the respective classifying signals;

and means for maintaining a just preceding heading indication when the level of said output signals generated from said sensor output windings get into predetermined abnormal signal level regions under the effect of disturbance of the earth's magnetic field.

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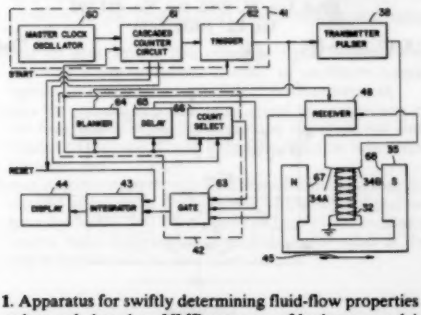
**4,480,227**

## PORTABLE PULSED NMR INSTRUMENT AND METHOD OF USE

**Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Continuation of Ser. No. 255,978, Apr. 15, 1981, abandoned.**
**This application Jun. 27, 1983, Ser. No. 508,365**
**Int. Cl.³ G01N *27/00***
**U.S. Cl. 324—303** **44 Claims**



1. Apparatus for swiftly determining fluid-flow properties of a rock sample based on NMR response of hydrogen nuclei of interstitial fluids within pore spaces of said sample in which DC field inhomogeneity and phase background jitter are used to increase data-throughput efficiency (DTE) comprising:

(a) magnet means for producing a DC magnetic field acting on said rock sample, said magnetic field having an intensity of at least 1 kilogauss and an inhomogeneity of at least D gauss over said sample to provide a series of nuclear magnetization build-ups associated with said interstitial fluids within said sample as a function of time;

(b) RF coil means acting at right angles to said DC magnetic field;

(c) transmitter means including control means connected to said RF coil means to produce a series of orthogonal RF magnetic field pulses of specified frequency, amplitude and duration, for interrogating said sample, said amplitude being at least greater than the variation D in said DC field over said sample;

(d) receiver means connected to said RF coil means for forming at least an output signal proportional to said nuclear magnetic resonance response of said interstitial fluids;

(e) said transmitter means including control means having a phasal background jitter characteristic associated therewith that randomly varies with time so that said sample can be repetitively interrogated to serially indicate nuclear magnetization relaxation without need for applying rescrambling reversing RF magnetic field pulses prior to the start of each magnetization build-up cycle.

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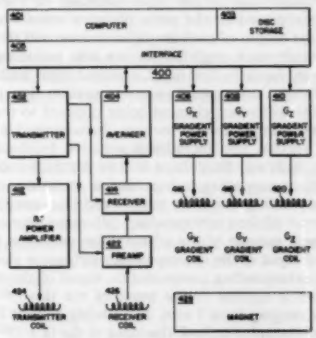
**4,480,228**

## SELECTIVE VOLUME METHOD FOR PERFORMING LOCALIZED NMR SPECTROSCOPY

**Paul A. Bottomley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 15, 1982, Ser. No. 434,688**
**Int. Cl.³ G01R *33/08***
**U.S. Cl. 324—309** **23 Claims**



1. A method of performing localized NMR chemical shift spectroscopy comprising the steps of:

(a) positioning an NMR sample in a homogeneous magnetic field directed along an axis thereof;

(b) irradiating said NMR sample with a first RF pulse in the presence of a first magnetic field gradient so as to isolate a plurality of nuclear spins in a planar slice of said NMR sample;

(c) applying a second RF pulse having a predetermined frequency content in the presence of a second magnetic field gradient so as to excite a fraction of said nuclear spins situated in a predetermined strip-like region of said planar slice oriented perpendicular to the direction of said second magnetic field gradient;

(d) applying a third RF pulse having a predetermined frequency content in the presence of a third magnetic field gradient so as to invert nuclear spins in a predetermined volume of said strip-like region, said inverted nuclear spins producing a spin echo signal; and

(e) sensing said spin echo signal in the absence of magnetic field gradients such that Fourier transformation of said spin echo signal yields a localized chemical shift spectrum from said predetermined volume.

**4,480,229**

## AMPLIFIER ARRANGEMENT WITH PARALLEL-OPERATED AMPLIFIER SECTIONS

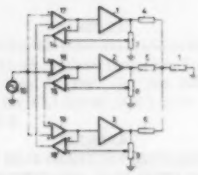
**Theodorus J. Van Kessel, Eindhoven, Netherlands; Nico V. Franssen, deceased, late of Knegsel, Netherlands, and by Friedrich J. de Haan, administrator, Estherdal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 214,942, Dec. 10, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 450,838**

**Claims priority, application Netherlands, Dec. 19, 1979, 7909126**

**Int. Cl.³ H03F *3/68***

**U.S. Cl. 330—84** **2 Claims**



1. An amplifier arrangement, comprising: a signal input coupled to inputs of n amplifier sections which sections include outputs connected single-ended to a common output circuit through which the output signal currents of the amplifier sections are passed in the same phase; a resistor connected between the output of each amplifier section and the common output circuit; each amplifier section also including a difference element having a first input, a second input, and an output for supplying a corresponding compensation signal, the first input of the difference element being coupled to the input of the corresponding amplifier section; characterized in that each amplifier section also includes a negative feedback voltage which depends on the voltage across the output circuit and across the corresponding resistor, and an attenuator coupled to the corresponding amplifier output and also coupled to the second input of the corresponding difference element so that the feedback voltage of the $k^{th}$-amplifier section is applied to the second input of the corresponding difference element, and that the corresponding compensation signal of the $k^{th}$-amplifier section is applied to the input of the $(k+1)^{th}$-amplifier section (k ranging from 1 to n, and n being at least 2) through a summator coupled to both the input of the $(k+1)^{th}$-amplifier section and the signal input of the arrangement, whereby the arrangement has a low distortion and a high output power during operation.

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**4,480,230**

## LARGE SWING CMOS POWER AMPLIFIER

**Kevin E. Brehmer; James B. Wieser, both of Newark, and Carlos A. Laber, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Jul. 5, 1983, Ser. No. 510,713**

**Int. Cl.³ H03F *3/45, 3/30***

**U.S. Cl. 330—255** **18 Claims**

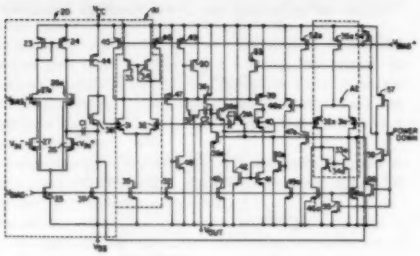
1. A large swing CMOS power amplifier, comprising:

an input differential amplifier operable to produce an amplified output signal at an output terminal in accordance with the difference of input signals coupled to amplifier input terminals;

a common source amplifier, having an input terminal coupled to receive said input differential amplifier output signal and operable to produce an output signal in accordance therewith, wherein said input differential amplifier and said common source amplifier provide a high gain amplifier input stage;

an output differential amplifier coupled to said common source amplifier to produce output signals at output differential amplifier output terminals in accordance with said common source amplifier output signal; and

a push-pull output amplifier driven by said output differential amplifier and operable between a positive and a negative power source extreme to produce a large swing output signal in accordance therewith, wherein said output differential amplifier and said push-pull output amplifier provide a unity gain amplifier output stage.



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**4,480,231**

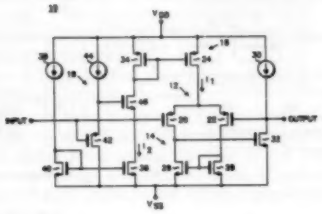
## CIRCUIT FOR REDUCING OFFSET VOLTAGE DRIFT IN DIFFERENTIAL AMPLIFIERS

**Shigeru Takehara, Tokyo, Japan, assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Aug. 25, 1982, Ser. No. 411,192**

**Int. Cl.³ H03F *1/26***

**U.S. Cl. 330—261** **11 Claims**



1. A circuit for reducing offset voltage drift in a differential amplifier having an offset voltage comprising:

a differential pair of transistors coupled to an input terminal adapted to receive an input signal and coupled to an output terminal;

current source means coupled to a first supply voltage terminal and to said differential pair, for providing a predetermined current to said differential pair;

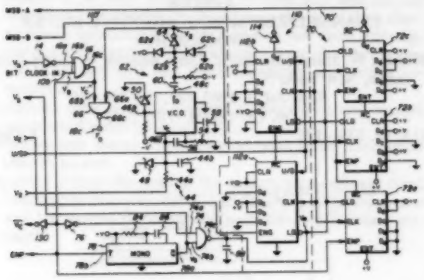
active load means coupled to a second supply terminal and to said differential pair, for developing an output voltage; and

control means coupled to said current source means and to said input terminal, for varying said predetermined current in response to variation of said input signal to maintain a substantially constant offset voltage.

## 4,480,232
## METHOD AND APPARATUS FOR DIGITAL AUTOMATIC FREQUENCY CONTROL OF CHIRPED OSCILLATOR

Lewin T. Baker, and Eugene J. Orlowski, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,948
Int. Cl.³ H03B 23/00; H03L 7/08
U.S. Cl. 331—1 A 28 Claims



13. Apparatus for providing a frequency-chirped signal with controllable frequency characteristics, comprising:

a first input terminal receiving a clock signal having a predetermined frequency;

a second input terminal receiving a bit clock signal defining each of a sequence of bit time intervals;

an output terminal;

means receiving said clock signal and said bit clock signal for forming a frequency-controlling ramp signal during each bit time interval;

an oscillator having an input receiving the ramp signal, and an output coupled to said output terminal and providing an output signal having an instantaneous frequency responsive to the instantaneous magnitude of said ramp signal;

means for generating a first transition signal responsive to counting a predetermined number of oscillator output signal cycles after the start of each bit time interval;

means for generating a first error signal by comparison of the time at which the first transition signal occurs with respect to the time at which the associated bit time interval ends; and

means cooperating with said ramp-signal-forming means for varying at least one characteristic of the ramp signal responsive to the first error signal to control the oscillator output signal frequency to a selected initial value at the beginning of each bit time interval.

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## 4,480,233
## PLANAR MULTIPLE OSCILLATOR CIRCUIT

Peter A. Juul, Irvine, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

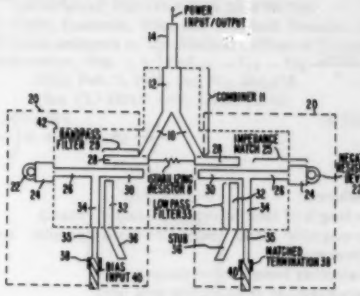
Filed Sep. 27, 1982, Ser. No. 424,948
Int. Cl.³ H03B 7/14, 9/14
U.S. Cl. 331—56 7 Claims

1. A circuit for combining the output powers of at least two oscillators, each oscillator comprising a two-terminal negative-resistance active device, said circuit comprising: p1 an electrically conductive common output junction for drawing off said combined output powers;

a planar transmission line spoke connected between each oscillator and the common output junction, wherein all spokes have equal length; and

a stabilization resistor coupled between each pair of adjacent oscillators, said resistor having a value to insure, by means of reflecting an unacceptably high impedance when its associated active devices are out of phase with respect to each other, that said active devices do not operate out of phase with respect to each other;

each said oscillator further comprising a diplexer having a first port coupled to the active device, a second port coupled to a DC bias associated with the active device, and a third port coupled to the spoke associated with said oscillator, said diplexer comprising:



a bandpass filter coupled between the associated spoke and the active device, and a lowpass filter having a first port coupled to the active device and a second port coupled to the DC bias via a bias line and a matched termination fabricated of a material having a known impedance over a wide RF frequency range; wherein

the combination of the bias line, the matched termination, and the diplexer controls out-of-band impedances to insure parametric stability of the oscillator.

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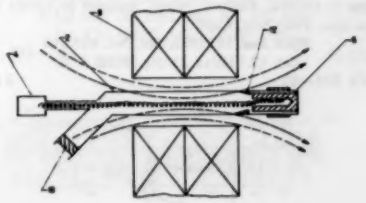
## 4,480,234
## GYROTRON BACKWARD WAVE OSCILLATOR DEVICE

Jonathan M. Wachtel, Rechovot, Israel, assignor to Elta Electronics Industries Ltd., Ashdod, Israel

Filed Sep. 18, 1981, Ser. No. 303,604
Claims priority, application Israel, Dec. 9, 1980, 61680
Int. Cl.³ H01J 25/46, 25/00
U.S. Cl. 331—82 4 Claims



1. A gyrotron backward wave oscillator device characterized in that it includes:

an evacuated waveguide section;

an electron source at one end of said waveguide section providing a spiral electron beam;

a collector at the opposite end of said waveguide section;

means for producing a magnetic field parallel to the longitudinal axis of said waveguide section; and

an output window at said one end of the waveguide section, the parameters of the device being such as to support backward wave oscillation therein and to output same through said window; the parameters being such that the device operates above a threshold defined by the following relationships:

$$L = G\left[\left(\frac{16\pi^2 E_o m C^4}{e}\right)\left(\frac{qA}{I}\right)\left(\frac{v_{\parallel}^3}{v_{\perp}^2(C^2 - v_{\perp}^2 - v_{\parallel}^2)^{\frac{1}{2}}}\right)\frac{(f^2 - f_{co}^2)^{\frac{1}{2}}}{f_{co}^2}\right]^{\frac{1}{3}}$$

$$B = \frac{2\pi mC}{e}(C^2 - v_{\perp}^2 - v_{\parallel}^2)^{-\frac{1}{2}}\left[f + \frac{v_{\parallel}}{C}(f^2 - f_{co}^2)^{\frac{1}{2}} + H\left(\frac{v_{\parallel}}{L}\right)\right]$$

wherein:

L = length of tube waveguide section (meters);

B = magnetic field strength (field parallel to axis)-(webers/$m^2$);

I = electron beam current (amps);

A = waveguide cross-section area ($m^2$);

q = electron beam shape factor (form factor);

f = desired operating frequency (Hz);

$f_{co}$ = waveguide cutoff frequency (Hz);

$v_{\parallel}$ = electron beam velocity parallel to axis (m/sec);

$v_{\perp}$ = electron beam velocity perpendicular to axis (m/sec);

m = mass of electron (kgm);

e = charge of electron (coulomb);

C = speed of light in vacuum (m/sec);

$\epsilon_o$ = permitivity of vacuum (farad/m); and

G and H define "gain" and "detuning" parameters, respectively, and have the following relative relationships for the various thresholds of oscillation:

| G | .292 | .781 | 1.269 | 1.765 | ... |
|---|---|---|---|---|---|
| H | .221 | .705 | 1.184 | 1.666 | ... |

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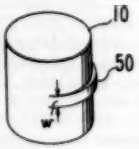
**4,480,235**

## COAXIAL MAGNETRON WITH IMPROVED STARTING

**William A. Gerard, Andover, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Filed Jan. 18, 1983, Ser. No. 459,013**
**Int. Cl.³ H01J 25/50; H03B 9/10**
**U.S. Cl. 331—91** **8 Claims**




1. A crossed field electron discharge oscillator comprising:

cathode means for generating a stream of electrons, including an electron emitter with a generally cylindrical surface having at least one radially extending projection which is asymmetrical with respect to the axis of said cylindrical surface;

a vacuum envelope for maintaining a vacuum about said stream;

microwave circuit means for supporting electromagnetic fields in interactive relationship with said stream of electrons;

means for coupling electromagnetic wave energy from said circuit means;

means for applying an electric field between said cathode means and said circuit means; and

means for applying a magnetic field perpendicular to said electric field in the region of said stream, said projection on said electron emitter being operative to enhance starting of said oscillator in a desired mode without substantially reducing the power output of said oscillator.

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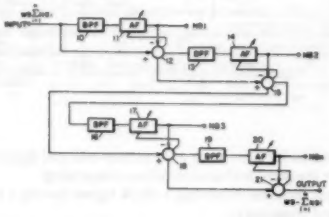
**4,480,236**

## CHANNELIZED SERIAL ADAPTIVE FILTER PROCESSOR

**Richard W. Harris, Bountiful, Utah, assignor to Sperry Corporation, New York, N.Y.**

**Filed Jul. 1, 1982, Ser. No. 394,486**
**Int. Cl.³ H03H 7/01, 7/46**
**U.S. Cl. 333—174** **8 Claims**




1. A filter circuit system comprising,

input means for supplying a wideband signal which contains undesirable narrowband signal components,

bandpass filter means connected to said input means,

adaptive filter means connected to receive signals from said bandpass filter means, and

summing means connected to sum said input signal and the signal produced by said adaptive filter means and to produce a control signal which is applied to said adaptive filter means to control the operation thereof.

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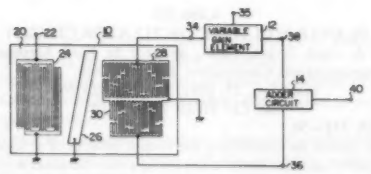
**4,480,237**

## SURFACE ACOUSTIC WAVE APPARATUS WITH A VARIABLE AMPLITUDE-FREQUENCY CHARACTERISTIC

**Jun Yamada, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 27, 1982, Ser. No. 424,371**
**Claims priority, application Japan, Oct. 2, 1981, 56-156252**
**Int. Cl.³ H03H 9/64, 9/42**
**U.S. Cl. 333—193** **11 Claims**




1. A surface acoustic wave apparatus with a variable amplitude-frequency characteristic comprising

an input terminal for receiving an electric input signal;

a surface acoustic wave element having an input electrode for converting said electric input signal to a surface acoustic wave and propagating the latter to the surface portion of a piezoelectric substrate and output electrodes for

converting said propagated surface acoustic wave again to an electric signal, said input electrode being formed by a first interdigital electrode while said output electrode being formed by internally connected second and third interdigital electrodes and provided at a position where the surface acoustic waves radiated from said first interdigital electrode and reaching said second and third interdigital electrodes respectively do not mutually couple and the delay time characteristic appearing between said first and second interdigital electrodes and the phase characteristic of a filter determined by said first and second interdigital electrodes are the same as the delay time characteristic appearing between said first and third interdigital electrodes and the phase characteristic of a filter determined by said first and third interdigital electrodes, respectively;

a variable gain function element connected to said second interdigital electrode;

a connection means connected to said third interdigital electrode; and

an adder circuit for adding the output signal of said third interdigital electrode derived from said connection means and the output signal of said variable gain function element.

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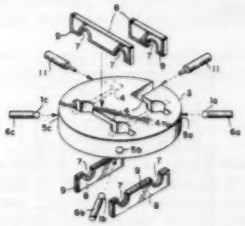
**4,480,238**

## YIG TUNED FILTER HAVING COUPLING LOOPS FORMED FROM CONDUCTIVELY LAYERED INSULATED PLATES

**Jun-ichi Iwasaki, Kumagaya, Japan, assignor to Takeda Riken Co. Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 419,921, Sep. 20, 1982, abandoned. This application Oct. 14, 1982, Ser. No. 434,320**
**Claims priority, application Japan, Sep. 18, 1981, 56-139731**
**Int. Cl.³ H01P *1/218***
**U.S. Cl. 333—202** **13 Claims**



1. A YIG microwave band pass filter comprising

a housing of non-magnetic material having holes formed therethrough between two faces of said housing, and slots on both said faces of said housing extending through respective ones of said holes,

a respective insulating plate for fitting into each said slot, each said insulating plate having at least one indentation at one side edge thereof, and a conducting layer disposed along at least a part of said side edge and along each said indentation in each said insulating plate to provide a respective coupling loop along each said indentation, each said indentation corresponding to a respective one of said holes,

a YIG element at a predetermined position in each said hole in said housing, said conducting layers of the respective insulating plates in said slots comprising mutually perpendicular ones of said coupling loops on opposite sides of each said YIG element, each said YIG element having a configuration matching with the respective indentations in the respective insulating plates, and

means for attaching each said insulating plate at a respective predetermined position in the respective slot,

wherein said filter has highly reproducible and stable characteristics as a result of said insulating plates being at respective predetermined positions with respect to said YIG elements.

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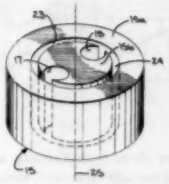
**4,480,239**

## LOOP-GAP RESONATOR NETWORK

**James S. Hyde, Dousman, Wis., and Wojciech Froncisz, Krakow, Poland, assignors to The Medical College of Wisconsin Inc., Milwaukee, Wis.**

**Filed Feb. 7, 1983, Ser. No. 464,473**
**Int. Cl.³ H01P *7/06*; G01R *33/08***
**U.S. Cl. 333—219** **10 Claims**



1. A lumped circuit loop-gap resonator network which comprises:

a block of material having a plurality of resonator loops formed therein by corresponding openings which extend lengthwise completely through the block and which have electrically conductive walls, and having a resonator gap formed by a slot which extends completely through the block and which intersects a pair of resonator loops along their entire length, and in which the walls of the slot are formed from an electrically conductive material.

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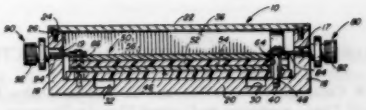
**4,480,240**

## APPARATUS FOR SEPARATING RF GROUND PLANE FROM HOUSING

**Harry J. Gould, 1649 E. Hale, Mesa, Ariz. 85204**

**Filed Sep. 30, 1982, Ser. No. 432,089**
**Int. Cl.³ H05K *5/02*; H01P *1/00***
**U.S. Cl. 333—246** **11 Claims**



1. Housing apparatus for electronic components, including, in combination:

housing means, including bottom means, for receiving electronic components;

dielectric means comprising a dc electrical block disposed on the bottom means;

circuit board means for electronic components disposed on the dielectric means, including

a substrate,

a ground plane on the substrate, and

a track side on the substrate remote from the ground plane for receiving electronic components; and

low impedance areas and high impedance areas on the bottom means defining rf choke means beneath the ground plane.

## 4,480,241
## DISCRIMINATOR DEVICE

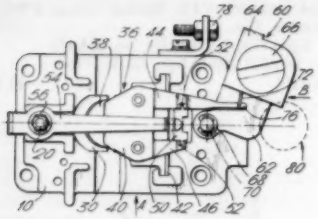
**Raymond T. Morris, Gateshead, England, assignor to Northern Engineering Industries plc, England**

**Filed Feb. 9, 1983, Ser. No. 465,154**

**Claims priority, application United Kingdom, Feb. 20, 1982, 8205082**

**Int. Cl.³ H01H** *71/04*

**U.S. Cl. 335—17** **6 Claims**



**1.** A discriminator device comprising a support structure, stop means mounted on said structure, means on said structure defining a pivot axis, a rotor mounted on said structure and angularly displaceable about said pivot axis to positions including first and second positions, said first position being intermediate said stop means and said second position, an electromagnetic mechanism mounted on said structure and an interceptor member carried by said structure and displaceable relatively thereto in first and second senses respectively towards and away from a station in which said interceptor member is normally engaged by said rotor in said first position, displacement of said interceptor member in said second sense propelling said rotor towards said stop means, an interval less than a predetermined value between a displacement of said interceptor member in said second sense and a displacement in said first sense allowing said interceptor member to return to said station early enough to intercept said rotor at said first position after said rotor has struck said stop means and in the return motion of said rotor therefrom, but a longer interval causing said interceptor member to be too late to intercept said rotor which continues in its return motion beyond said first position to reach said second position, and said mechanism being operable to displace said interceptor member in at least one of said first and second senses.

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## 4,480,242
## VARIABLE TORQUE CONTACT ARM FOR ELECTRIC CIRCUIT BREAKERS

**Roger N. Castonguay, Terryville, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.**

**Filed Mar. 28, 1983, Ser. No. 479,616**

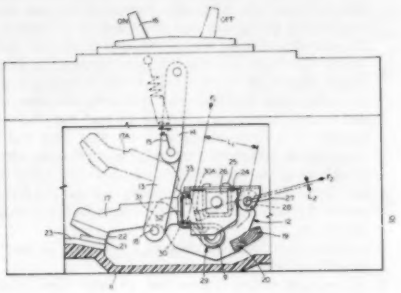
**Int. Cl.³ H01H** *3/00*

**U.S. Cl. 335—194** **9 Claims**

**1.** An improved contact arm at arrangement for electric circuit breakers of the type consisting of an operating handle connected with an operating mechanism and circuit breaker contacts for both manual and automatic opening of the contacts wherein the improvement comprises:

a movable contact arm linked with said operating mechanism and pivoted at one end for opening independently of said operating mechanism; and a movable contact mounted at an opposite end of said contact arm; and

a contact spring for biasing said contacts in a closed position, said contact spring being slidably coupled with said contact arm for providing a first torque on said contact arm at one location along said contact arm and a second torque on said contact arm at another location along said



contact arm, both of said locations being intermediate both ends of said contact arm.

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## 4,480,243
## ELECTROMAGNETIC RELAY

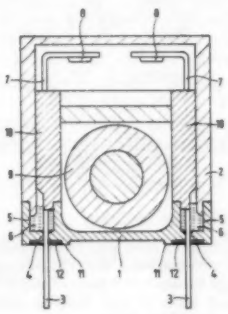
**Werner Minks, Kleingeschaidt, Fed. Rep. of Germany, assignor to International Standard Electrik Corporation, New York, N.Y.**

**Filed Jul. 15, 1982, Ser. No. 398,470**

**Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131019**

**Int. Cl.³ H01H** *45/04;* **H05K** *5/06*

**U.S. Cl. 335—202** **3 Claims**



**1.** An electromagnetic relay comprising:

a housing including a substantial flat bottom part and an inverted cap-shaped upper part;

a circumferential groove in the upper side of said bottom part;

an adhesive in said groove;

said cap-shaped upper part having side walls providing a circumferential enclosure, the lower ends of all of said side walls being located in said groove so as to be immersed in said adhesive;

apertures in said bottom part opening into said groove; and

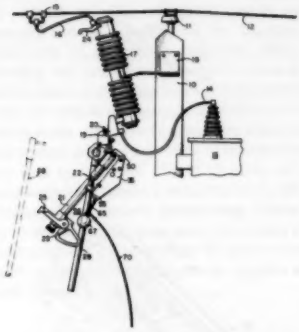
electrical terminals in said housing passing downwardly through the adhesive in said groove into said apertures whereby said adhesive seals both said cap-shaped upper part to said bottom part and seals said terminals to said bottom part.

4,480,244

## APPARATUS FOR THE REMOTE CLOSING OF FUSE CIRCUITS

Donald R. Manning, 507 Susquehann Ave., Milton, Pa. 17847

Filed Jun. 28, 1982, Ser. No. 393,097
Int. Cl.³ H01H 71/10
U.S. Cl. 337—171 6 Claims



1. Apparatus for remote closing of a pivotally mounted fuse carrying switch member which has an open end, is carried by an insulating support, and which has latching members for retaining said switch member in operating position which comprises

a body portion for detachable engagement with said switch member,

said body portion having a hook for insertion in said switch member open end, a clamp for engagement with the exterior of said switch member,

a crank means extending from said body portion for positioning in said body portion for operation of said apparatus, and

a cord connected to said crank means for moving said apparatus and the switch member to operating position.

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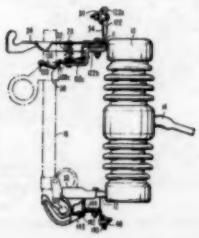
4,480,245

## ELECTRIC CUTOUT

Charles H. Carothers, Bloomington; John E. Garau, Martinsville, and Thomas P. Basa, Bloomington, all of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1983, Ser. No. 461,794
Int. Cl.³ H01H 71/08
U.S. Cl. 337—180 5 Claims



1. An electrical cutout comprising:

a support insulator having at each of two spaced locations a combination line terminal and fuse holder assembly; each of said line terminal and fuse holder assemblies including a line terminal, a fuse support element and means for support thereon on said insulator and also including a contact element, more highly conductive than said other assembly elements, that extends continuously from said line terminal to said fuse support element for a highly conductive path therebetween free of mechanical joints, and said contact element comprises a first portion at said line terminal for direct contact to a line connected thereto.

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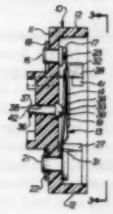
4,480,246

## TRIP-FREE MANUAL RESET THERMOSTAT

Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Oct. 18, 1982, Ser. No. 435,080
Int. Cl.³ H01H 37/04
U.S. Cl. 337—348 8 Claims



1. A trip-free manual reset snap discoperated condition sensing device comprising a body assembly, a switch on said body assembly including a fixed contact and a movable contact, said movable contact being movable in a first direction from a switch-closed position in engagement with said fixed contact to a switch-open position spaced from said fixed contact, a snap disc in said body movable with snap action from a reset position to an operative position in response to a predetermined condition, said snap disc being operatively connected to said movable contact and operating to move said movable contact to said switch-open position in response to movement of said snap disc to said operative position, and a manual reset member mounted on said body assembly and providing a user accessible portion which is moved by such user in said first direction to reset said disc, said reset member when operated applying a resetting force in said first direction to said snap disc to move said snap disc to said reset position and also cause said snap disc to maintain said movable contact in said switch-open position so long as said resetting force is applied, release of said manual reset members allowing said movable contact to move to said switch-closed position only when said snap disc remains in said reset position.

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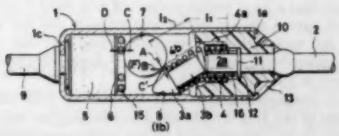
4,480,247

## THERMAL CUTOUT FUSE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Kanagawa, Japan

Filed Sep. 29, 1982, Ser. No. 425,677
Claims priority, application Japan, Oct. 6, 1981, 56-158144
Int. Cl.³ H01H 37/76
U.S. Cl. 337—407 1 Claim



1. In a thermal cutout fuse comprising:

a movable contact member composed of a first lead wire thrust into a housing, a shank portion opposed to the thrust end of said first lead wire within the housing, and a

movable contact surface formed at the leading end thereof,

a stationary contact surface formed inside said housing round said movable contact surface and electrically connected to a second lead wire extended outwardly from said housing,

a coil spring disposed astride round said shank portion of said movable contact member and said thrust end of said first lead wire and adapted to support mechanically said movable contact member in position and assume resilient force of bending elasticity tending to separate said movable contact member from said stationary contact surface toward a second posture when said movable contact member is brought into a first posture having the movable contact surface kept in contiguity with said stationary contact surface,

a thermally sensitive pellet formulated to have a melting point confirming to the preset unsafe temperature and disposed inside said housing opposite said movable contact member, and

a solid member interposed between said thermally sensitive pellet and said movable contact member and adapted to keep said movable contact member in said first posture against the bending elasticity of said coil spring, the improvement which comprises an insulator layer interposed between said coil spring and said thrust end of said first lead wire and said coil spring adapted to assume compressive elasticity in the longitudinal direction thereof in said first posture having contiguity between said movable contact surface and said stationary contact surface and between said shank portion of said movable contact member and said thrust end of said first lead wire, whereby said shank portion and said thrust end are separated from each other during the beginning of the motion toward said second posture.

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**4,480,248**

## TEMPERATURE AND AGING COMPENSATED MAGNETORESISTIVE DIFFERENTIAL POTENTIOMETER

**Michio Sudo, Kuki, and Hitoshi Miura, Tatebayashi, both of Japan, assignors to Kangyo Denkikiki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 21, 1983, Ser. No. 477,572**

**Claims priority, application Japan, Mar. 29, 1982, 57-50645**

**Int. Cl.³ G01R *33/02*; H01L *43/08***

**U.S. Cl. 338—32 R** **10 Claims**

1. A magnetoresistive differential potentiometer comprising:

a substrate fabricated of an insulating material;

first and second magnetoresistive parts formed in spaced relation to one another on said substrate in alignment with one another along a line, said first and second parts being electrically connected in series with one another, being of the same length, and having resistance values which are similar to each other in the absence of a magnetic field;

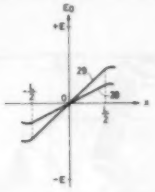
a third magnetoresistive part formed on said substrate adjacent said spaced first and second magnetoresistive parts;

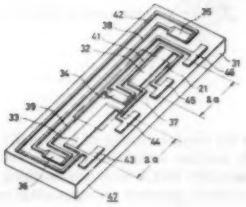
a movable magnet having a length, along said line, equal to the distance between the center points of said first and second magnetoresistive parts, said magnet being disposed above said substrate and being so movable along said line that at least a fixed length portion of said third magnetoresistive part is always under said magnet and the sum of first and second length portions of said first and second magnetoresistive parts which are disposed under said magnet is always constant;

a fourth magnetoresistive part formed on said substrate outside of the area which said movable magnet may cover during its movement, said fourth part being electrically connected in series to said third magnetoresistive part and having a resistance value similar to that of said third magnetoresistive part in the absence of a magnetic field;

means connecting said series connected first and second magnetoresistive parts in parallel with said series connected third and fourth magnetoresistive parts to form a bridge circuit;

first and second terminals electrically connected to opposing ends of said parallel connection, respectively, for supplying a voltage across said bridge circuit; and





third and fourth terminals electrically connected to the series connection point between said first and second magnetoresistive parts and to the series connection point between said third and fourth magnetoresistive parts, respectively, for deriving outputs therefrom.

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**4,480,249**

## ALARM SYSTEMS FOR AUTOMOTIVE VEHICLES

**William A. Heidman, Jr., 4604 Robbins, San Diego, Calif. 92122**

**Continuation-in-part of Ser. No. 139,789, Apr. 14, 1980, Pat. No. 4,354,174. This application Jul. 14, 1982, Ser. No. 398,104**

**Int. Cl.³ B60R *25/00***

**U.S. Cl. 340—63** **15 Claims**

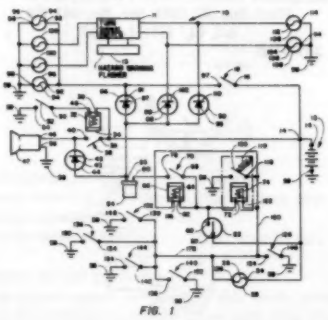

FIG. 1

1. An alarm system for automotive vehicles having a horn and a source of electrical power comprising:

front and rear indicator lamps;

a power activating and deactivating switch connected to said source of electrical power and switchable between system activated and system inactivated positions;

a system activating means inter-connected to said power activating and deactivating switch;

an activated alarm system maintaining means associated with said system activating means;

an alarm system inactivating means associated with said source of electrical power and said system activating means for inactivating said alarm system when said source of electrical power is at a predetermined voltage level; and

a plurality of parallel connected switching means associated with vehicle movable structural panels switchable between off and on positions by the opening and closing respectively of said panels, whereby when said power activating and deactivating switch is in said system activated position and at least one of said plurality of parallel connected switching means is repositioned from an off to an on position said system activating means activates said alarm system causing said horn to intermittently blast and when said at least one of said plurality of parallel connected switching means is returned to its off position said activated alarm system maintaining means causes said horn to intermittently blast until said power activating and deactivating switch is returned to its deactivated position or said source of electrical power reaches said predetermined voltage level.

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**4,480,250**

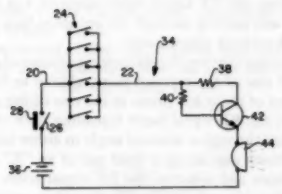
## CREDIT CARD CARRIER WITH ALARM

**Charles D. McNeely, 3060 Killian Rd., Uniontown, Ohio 44685**

**Filed Nov. 27, 1981, Ser. No. 325,235**

**Int. Cl.³ G08B *7/00, 21/00***

**U.S. Cl. 340—568** **8 Claims**




1. A card carrier, comprising:

a plurality of receptacles for receiving and maintaining cards;

sensing means associated with each receptacle for determining the presence or absence of a card therein;

alarm means operatively connected to each said sensing means for emitting a signal upon the absence of a card from any of said receptacles; and

a pair of flaps, foldable onto each other, said flaps receiving said receptacles, sensing means, and alarm means, wherein said flaps include switch means in operative interconnection with said alarm means disabling said alarm means when said flaps are open.

**4,480,251**

## APPARATUS TO MONITOR ELECTRICAL CABLES, INCLUDING SPLICE JOINTS AND THE LIKE, FOR THE INGRESS OF MOISTURE

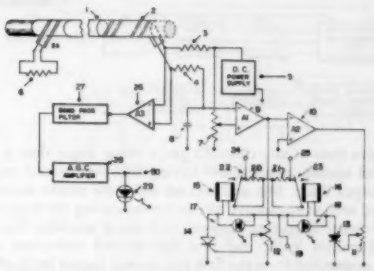
**John P. McNaughton; Wayne E. Domenco, and David E. Vokey, all of Winnipeg, Canada, assignors to Norscan Instruments Ltd., Winnipeg, Canada**

**Continuation of Ser. No. 256,027, Apr. 21, 1981, abandoned. This application Sep. 9, 1983, Ser. No. 530,741**

**Claims priority, application United Kingdom, Apr. 22, 1980, 8013148**

**Int. Cl.³ G0?B *21/00***

**U.S. Cl. 340—604** **9 Claims**




1. Apparatus for monitoring an electrical cable along its full length and at a plurality of specific points along its length comprising a pair of separate conductors installed along the full length of the cable, dielectric insulating means between the two conductors arranged such that the presence of moisture adjacent the conductors reduces the resistance of the insulating dielectric between the two conductors, a source of electric power connected across the conductors whereby the reduced resistance causes an increased current in the conductors, a plurality of electronic detection means each arranged at a respective one of the specific points and each including means for detecting the presence of moisture at the specific point, means responsive to the detection of the presence of moisture for developing an AC signal indicative of the specific point concerned and terminal means for connecting the AC signal across said pair of conductors and central electronic detection means connected to said conductors including first means responsive to said increased current, second means responsive to said AC signals and indicating means responsive to said first and second means for signalling the presence of moisture.

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**4,480,252**

## GAS DETECTOR

**Carlos E. Buonavita, Pasadena, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

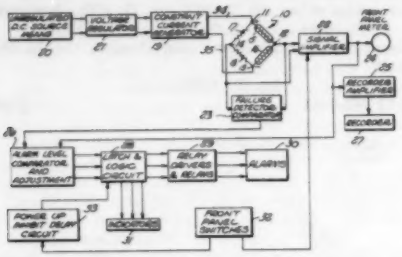
**Filed Dec. 14, 1981, Ser. No. 330,139**

**Int. Cl.³ G08B *17/10***

**U.S. Cl. 340—632** **6 Claims**

1. A combustible gas detector comprising: a Wheatstone bridge including first, second, third and fourth terminal junctions, first and second combustible gas detector elements, said first element being connected between said first and second junctions, said second element being connected between said second and third junctions, said Wheatstone bridge including first and second resistors, said first resistor being connected between said first and fourth junctions, said second resistor being connected between said third and fourth junctions; source means including a constant current generator connected to deliver a constant current to said first junction and connected to receive said constant current from said third junction; first and second bridge output leads connected from said second and fourth junctions; a signal amplifier connected between said bridge output leads, said signal amplifier having at least first and second output leads; first and second comparators each connected from the first and second output leads of

said signal amplifier, respectively, said first comparator producing a first stepped signal when the voltage between said bridge output leads corresponds to a fraction x of the lower explosive limit of a detected gas, said second comparator producing a second stepped signal when the voltage between said bridge output leads corresponds to a fraction y of the lower



explosive limit of said detected gas, x being larger than y, said first and second comparators having first and second respective output leads; first and second indicator means including first and second respective alarms for indicating the magnitude of any signal appearing between said signal amplifier first and second output leads; and first and second individual latch means connected from the first and second output leads of said first and second comparators to turn on respective first and second alarms, each latch means being actuable by a corresponding one of said stepped signals.

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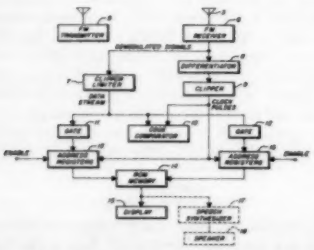
**4,480,253**

## WRIST WATCH WEATHER RADIO

**Howard M. Anderson, 325 Highland Ave., West Newton, Mass. 02165**

**Filed Jun. 1, 1983, Ser. No. 500,005**
**Int. Cl.³ H04Q 7/02; H04B 1/16**
**U.S. Cl. 340—825.69** **3 Claims**



**1.** A portable device for presenting information on the state of the weather comprising

(a) a radio receiver for receiving binary coded radio signals;

(b) means for deriving a stream of data signals from the coded radio signals,

(c) means for deriving clock pulses from the received radio signals, the clock pulses being synchronous with the bits in the stream of data signals,

(d) first and second gates, the data stream being applied as the input to both gates,

(e) a code comparator for comparing the data signals with bit patterns representing today's weather and tomorrow's weather, the code comparator emitting an enable signal to the first gate upon the occurrence of a match with the pattern representing today's weather and emitting an enable signal to the second gate upon the occurrence of a match with the pattern representing tomorrow's weather,

(f) first address registers, the output of the first gate providing the input to the first address registers,

(g) second address registers, the output of the second gate providing the input to the second address registers,

(h) a read only memory having information pertaining to different weather states stored at predetermined addresses, the outputs of the first and second address registers providing the input to the read only memory, and

(i) means responsive to the output of the read only memory for providing information on the state of the weather.

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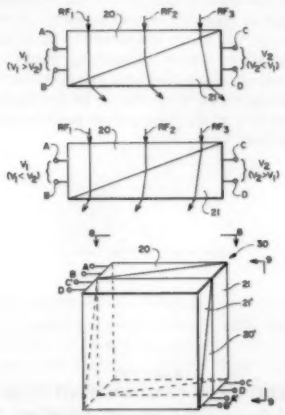
**4,480,254**

## ELECTRONIC BEAM STEERING METHODS AND APPARATUS

**Donald B. Spencer, Federal Way, and John L. Fitch, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 30, 1982, Ser. No. 431,058**
**Int. Cl.³ H01Q 19/06, 15/08**
**U.S. Cl. 343—708** **16 Claims**



**1.** The method of steering an RF signal beam comprising:

(a) forming a composite prism structure comprising n pairs of back-to-back prisms of ferroelectric dielectric material where "n" equals 1 or 2 and wherein the entrance face of the composite prism structure is parallel to the exit face of the composite prism structure;

(b) directing the RF signal beam along an axis general normal to and passing through the entrance face of the n pair of back-to-back prisms; and,

(c) selectively varying the dielectric constant of one prism in at least one of the n prism pairs relative to the dielectric constant of the other prism in the one of the n pairs so as to steer the RF signal beam transiting each of the n pairs of prisms through a selected angle to either side of the RF signal beam axis along at least one of an "X" and/or "Y" coordinate and wherein the RF signal beam is deflected from the axis only when the dielectric constant of one prism in each of the n pairs of prisms is different than that of the other prism in each of the n pairs of prisms.

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**4,480,255**

## METHOD FOR ACHIEVING HIGH ISOLATION BETWEEN ANTENNA ARRAYS

**Allen L. Davidson, Crystal Lake, Ill., assignor to Motorola Inc., Schaumburg, Ill.**

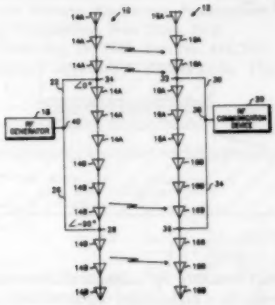
**Filed Dec. 6, 1982, Ser. No. 447,075**
**Int. Cl.³ H01Q 1/52**
**U.S. Cl. 343—844** **7 Claims**

**1.** In an antenna installation having at least first co-linear antenna array powered by an RF generator and a second co-linear antenna array which includes a plurality of radiators coupled to an RF communication device, a method for reducing the physical spacing between arrays while maintaining isolation between the RF generator and the RF communication device, comprising:

identifying, for the first array, first and second parts thereof for application of RF power thereto and, for the second array, first and second parts thereof for coupling to the RF communication device;

powering the first and second parts of the first antenna array with an RF generator such that said first and second parts thereof are driven substantially in phase quadrature with each other and at substantially equal power levels;

coupling the first and second parts of the second array to the RF communication device via a signal path such that substantially quadrature phasing is established between



the first and second parts of the second array so that received radiation emitted by the first part of the first array cancels received radiation from the second part of the first array in the signal path before reaching the RF communication device; and

adjusting the physical spacing between said first and second arrays such that the maximum spacing therebetween substantially precludes radiation emitted by the first part of the first array from being received by the second part of the second array, and substantially precludes radiation emitted by the second part of the first array from being received by the first part of the second array.

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**4,480,256**

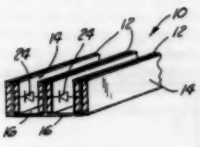
## MICROWAVE ABSORBER

**Lloyd W. Wren, Valley Center, Kans., assignor to The Boeing Company, Seattle, Wash.**

**Continuation-in-part of Ser. No. 294,046, Aug. 18, 1981, Pat. No. 4,381,510. This application Mar. 23, 1983, Ser. No. 478,203**

**Int. Cl.³ H01Q *17/00***

**U.S. Cl. 343—909** **11 Claims**



1. A microwave absorber for a reflecting surface, the absorber coupling and absorbing radio frequency energy at different angles of incidence, the absorber including:

an energy receiving surface adapted for receipt on the reflecting surface;

a first conducting transmission line wall mounted on the receiving surface;

a second conducting transmission line wall mounted on the receiving surface, the second transmission line wall disposed in a spaced relationship from the first transmission line wall, the receiving surface and the first and second wall forming an open channel configuration; and

means disposed in the open channel configuration for modulation of the absorption of the frequency energy received therein.

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**4,480,257**

## OPTICAL PRINTER COMPRISING LIGHT SWITCHING ELEMENTS

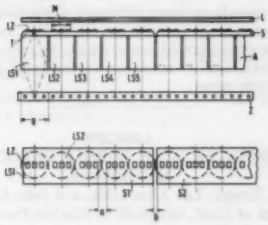
**Bernhard Hill, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 28, 1983, Ser. No. 461,840**

**Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224356**

**Int. Cl.³ G01D *9/42***

**U.S. Cl. 346—107 R** **6 Claims**



1. An optical printer which comprises: a light source; a light switching mask for generating a light dot raster, the mask including a carrier (T) provided with light switching elements; an optical imaging system, and a photosensitive record carrier, the imaging system being arranged between the light switching mask and the photosensitive record carrier in order to transfer the light dot raster generated in the light switching mask to the record carrier, characterized in that the light switching elements (LZ) are arranged in a row into groups (M) on the carrier (T), that adjacent groups (M) are separated by an equidistant intermediate space (a) in which no light switching elements are present and which is light-impermeable, that the optical imaging system (A) consists of a plurality of adjacently arranged self-focusing lenses (LS) which have the same dimensions and the same imaging properties, adjacent lenses being arranged at equal distances from one another, and that each group (M) of light switching elements (LZ) is associated with a self-focusing lens (LS).

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**4,480,258**

## MAGNETIC RECORDING MEDIUM

**Nobuo Nishimura; Teruhiko Itami; Toshifumi Kimoto, and Koichi Saitoh, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan**

**Filed May 11, 1982, Ser. No. 376,993**

**Claims priority, application Japan, Jul. 10, 1981, 56-106968**

**Int. Cl.³ G01D *15/34***

**U.S. Cl. 346—135.1** **2 Claims**

1. A magnetic recording medium, having a magnetic transformation point, for use in a thermomagnetic recording apparatus of the type comprising a heat generating part which operates in close contact with said recording medium wherein a current signal is applied to said heat generating part according to image data to be recorded in order to heat said magnetic recording medium to a temperature higher than said magnetic transformation point, and a magnetic head for recording said image data onto said magnetic recording medium; said magnetic recording medium comprising:

a magnetic recording layer for recording said image data; and

a high permeability recording control layer formed of Ni-

O.79FE alloy, having a relatively low Curie point and having first and second sides, said recording head being disposed adjacent said first side and said magnetic recording layer contacting said second side, for preventing said

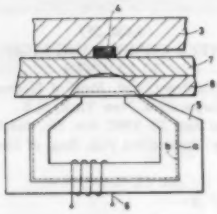

image data from being recorded when said high permeability recording control layer is below said Curie point and for allowing said image data to be recorded when said high permeability recording control layer is heated above said Curie point.

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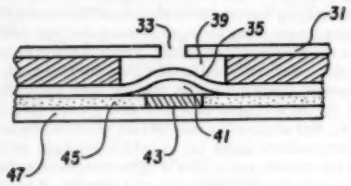
**4,480,259**

## INK JET PRINTER WITH BUBBLE DRIVEN FLEXIBLE MEMBRANE

**William P. Kruger, Los Altos Hills, and John L. Vaught, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 30, 1982, Ser. No. 403,824**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **7 Claims**



1. A print head comprising:
a cavity for containing ink;
an orifice in communication with the cavity;
a resistor;
a flexible membrane overlaying the resistor and having a surface in direct physical contact with a surface of the resistor, the flexible membrane being positioned to separate the resistor from the cavity; and
pockets, located between the surface of the flexible membrane and the surface of the resistor, for containing a working fluid.

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**4,480,260**

## COLOR-DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEETS

**Noboru Yamato; Akira Hasegawa; Hiroaki Umeda, and Mamoru Suzuki, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan**

**Filed Dec. 22, 1982, Ser. No. 452,281**
**Claims priority, application Japan, Dec. 24, 1981, 56-208149**
**Int. Cl.³ B41M *5/22***
**U.S. Cl. 346—209** **5 Claims**

1. A color-developing sheet for pressure-sensitive recording sheets having a color-developing layer on a base sheet, said color-developing layer comprising activated clay, zinc carbonate, thiourea compound selected from the group consisting of thiourea, trimethylthiourea, diethyl thiourea, dibutylthiourea, dilaurylthiourea, ethylenethiourea and diphenylthiourea and bisphenol compound.

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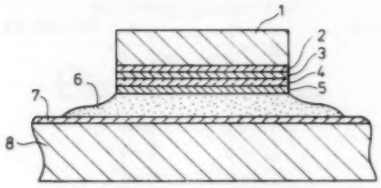
**4,480,261**

## CONTACT STRUCTURE FOR A SEMICONDUCTOR SUBSTRATE ON A MOUNTING BODY

**Hirotsugu Hattori, Takatsuki, and Masahiro Kuwagata, Suita, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan**

**Filed Jun. 18, 1982, Ser. No. 390,113**
**Claims priority, application Japan, Jul. 2, 1981, 56-104159**
**Int. Cl.³ H01L *23/54, 23/18***
**U.S. Cl. 357—71** **6 Claims**



1. A contact structure for a semiconductor substrate on a mounting body, for a high-power semiconductor device comprising:
a semiconductor substrate,
a multilayered electrode formed on a surface of said semiconductor substrate, said multilayered electrode comprising a chromium layer formed on said surface, a chromium-nickel alloy layer formed thereon, a nickel layer formed thereon and a noble metal layer of a metal selected from a group consisting of gold, silver, platinum and palladium formed further thereon,
a solder layer and
a mounting means for holding said semiconductor substrate thereon,
said solder layer soldering said multilayered electrode onto said mounting means, thereby bonding said semiconductor substrate onto said mounting means.

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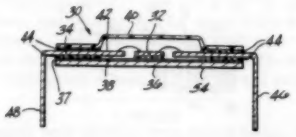
**4,480,262**

## SEMICONDUCTOR CASING

**Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.**

**Filed Jul. 15, 1982, Ser. No. 398,497**
**Int. Cl.³ H01L *21/52, 21/50, 23/40, 23/10***
**U.S. Cl. 357—74** **7 Claims**



1. A casing for an electrical component, comprising:
a metal base member;
a metal lead frame having a first surface disposed adjacent said metal base member and being adapted to have said electrical component connected thereto;
a premolded plastic housing member being disposed adjacent a second surface of said lead frame opposite said base member, said premolded plastic housing member having an inner surface shaped to form a hollow enclosure to receive said electrical component, said housing member

further including a metal foil membrane substantially covering said inner surface of said premolded housing member for forming an impervious barrier to interdiffusion of contaminants into said enclosure through said housing member; and

adhesive means between said base member and said housing member for bonding and sealing said metal lead frame therebetween so as to seal said electrical component in said casing.

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**4,480,263**

## THREE-DIMENSIONAL TELEVISION SYSTEM AND TRANSMITTER SUITABLE THEREFOR

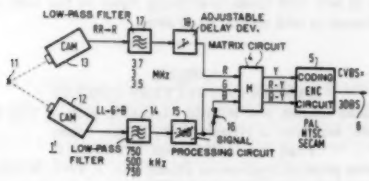
**Peter C. A. van Merode, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 10, 1982, Ser. No. 416,741**

**Claims priority, application Netherlands, Oct. 1, 1981, 8104475**

**Int. Cl.³ H04N 9/60**

**U.S. Cl. 358—3** **8 Claims**




1. A three-dimensional television system comprising a transmitter having a picture pick-up arrangement, a receiver incorporating a picture display device, and a signal transmission system arranged between the transmitter and the receiver, the picture pick-up arrangement comprising first and second picture pick-up devices for recording a scene from different positions, the picture display device having a color picture display screen for displaying in two different colors, information intended for a left and a right eye, respectively, of an observer, the items of information being contained in first and second subpictures, respectively, which are shifted in the direction of line scan, which, when the overall picture is observed with two eyes through spectacles having glasses of different colors, results in a three-dimensional picture, characterized in that said signal transmission system is suitable for signal transmission coded in accordance with the PAL, NTSC or SECAM-standards for which purpose the transmitter comprises a matrix-coding circuit and the receiver comprises a decoding-matrix circuit, both incorporating signal channels for processing color difference signals and a luminance signal, an output of the first picture pick-up device in the picture pick-up arrangement being coupled to at least one input of the matrix-coding circuit via a first low-pass filter, an output of the second picture pick-up device being coupled to at least one further input of the matrix-coding circuit, the first low-pass filter having a bandwidth which is not more than the bandwidth of the color difference signal channels in the decoding-matrix circuit of the receiver.

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**4,480,264**

## CHARGE COUPLED DEVICE BASED SYSTEM AND METHOD FOR MEASURING PROJECTED FIGURES

**Robert A. Duschl, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Jun. 14, 1982, Ser. No. 388,029**

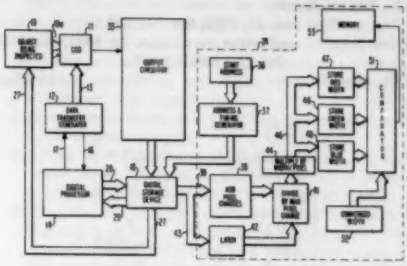
**Int. Cl.³ H04N 9/62, 7/18, 7/02**

**U.S. Cl. 358—10** **7 Claims**

5. A method of measuring a figure comprising the steps of:

casting an image of said figure onto a CCD and transferring the CCD data to a digital storage device wherein the data are stored in pixel lines in accordance with the horizontal rows and vertical columns of pixels on said CCD;

summing the charge data from a number of adjacent pixels in a pixel line to provide a summed signal;



dividing said summed signal by a full pixel signal to obtain a mean signal; and

multiplying said mean signal by a dimension per pixel value to provide a dimension of said figure.

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**4,480,265**

## PAL COMB FILTER

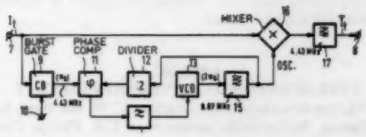
**Richard C. Spiero, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 30, 1982, Ser. No. 412,632**

**Claims priority, application Netherlands, Sep. 4, 1981, 8104101**

**Int. Cl.³ H04N 9/535**

**U.S. Cl. 358—31** **7 Claims**




1. A PAL comb filter, for use in an apparatus for playing back video signals recorded in adjacent tracks on a record carrier for chroma cross-talk reduction by means of chroma carrier phase inversion, comprising a first and a second transmission path, input means for applying a PAL chroma signal to the two transmission paths, a delay network for delaying the PAL chroma signal in the first path relative to the PAL chroma signal in the other path, and a signal combination circuit for combining the PAL chroma signal in the second path and the PAL chroma signal delayed in the first path with the correct polarity relative to each other in such a way that the result of this combination is again a PAL chroma signal, characterized in that the delay network exhibits a time delay such that in the first path the PAL chroma signal is delayed by a time corresponding to one line of a video picture relative to the PAL chroma signal in the second path, and PAL-phase inversion means are included for inverting the PAL-phase of the signal in one of the two paths.

O.79FE alloy, having a relatively low Curie point and having first and second sides, said recording head being disposed adjacent said first side and said magnetic recording layer contacting said second side, for preventing said

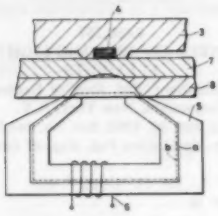


image data from being recorded when said high permeability recording control layer is below said Curie point and for allowing said image data to be recorded when said high permeability recording control layer is heated above said Curie point.

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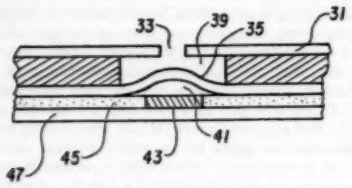
**4,480,259**

## INK JET PRINTER WITH BUBBLE DRIVEN FLEXIBLE MEMBRANE

**William P. Kruger, Los Altos Hills, and John L. Vaught, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 30, 1982, Ser. No. 403,824**
**Int. Cl.³ G01D** *15/18*
**U.S. Cl. 346—140 R** **7 Claims**



1. A print head comprising:
a cavity for containing ink;
an orifice in communication with the cavity;
a resistor;
a flexible membrane overlaying the resistor and having a surface in direct physical contact with a surface of the resistor, the flexible membrane being positioned to separate the resistor from the cavity; and
pockets, located between the surface of the flexible membrane and the surface of the resistor, for containing a working fluid.

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**4,480,260**

## COLOR-DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEETS

**Noboru Yamato; Akira Hasegawa; Hiroaki Umeda, and Mamoru Suzuki, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan**

**Filed Dec. 22, 1982, Ser. No. 452,281**
**Claims priority, application Japan, Dec. 24, 1981, 56-208149**
**Int. Cl.³ B41M** *5/22*
**U.S. Cl. 346—209** **5 Claims**

1. A color-developing sheet for pressure-sensitive recording sheets having a color-developing layer on a base sheet, said color-developing layer comprising activated clay, zinc carbonate, thiourea compound selected from the group consisting of thiourea, trimethylthiourea, diethyl thiourea, dibutylthiourea, dilaurylthiourea, ethylenethiourea and diphenylthiourea and bisphenol compound.

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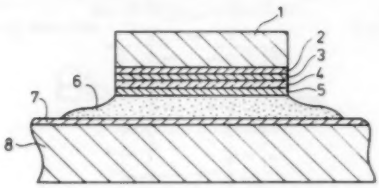
**4,480,261**

## CONTACT STRUCTURE FOR A SEMICONDUCTOR SUBSTRATE ON A MOUNTING BODY

**Hirotsugu Hattori, Takatsuki, and Masahiro Kuwagata, Suita, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan**

**Filed Jun. 18, 1982, Ser. No. 390,113**
**Claims priority, application Japan, Jul. 2, 1981, 56-104159**
**Int. Cl.³ H01L** *23/54, 23/18*
**U.S. Cl. 357—71** **6 Claims**



1. A contact structure for a semiconductor substrate on a mounting body, for a high-power semiconductor device comprising:
a semiconductor substrate,
a multilayered electrode formed on a surface of said semiconductor substrate, said multilayered electrode comprising a chromium layer formed on said surface, a chromium-nickel alloy layer formed thereon, a nickel layer formed thereon and a noble metal layer of a metal selected from a group consisting of gold, silver, platinum and palladium formed further thereon,
a solder layer and
a mounting means for holding said semiconductor substrate thereon,
said solder layer soldering said multilayered electrode onto said mounting means, thereby bonding said semiconductor substrate onto said mounting means.

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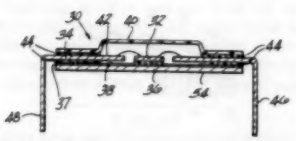
**4,480,262**

## SEMICONDUCTOR CASING

**Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.**

**Filed Jul. 15, 1982, Ser. No. 398,497**
**Int. Cl.³ H01L** *21/52, 21/50, 23/40, 23/10*
**U.S. Cl. 357—74** **7 Claims**



1. A casing for an electrical component, comprising:
a metal base member;
a metal lead frame having a first surface disposed adjacent said metal base member and being adapted to have said electrical component connected thereto;
a premolded plastic housing member being disposed adjacent a second surface of said lead frame opposite said base member, said premolded plastic housing member having an inner surface shaped to form a hollow enclosure to receive said electrical component, said housing member

further including a metal foil membrane substantially covering said inner surface of said premolded housing member for forming an impervious barrier to interdiffusion of contaminants into said enclosure through said housing member; and

adhesive means between said base member and said housing member for bonding and sealing said metal lead frame therebetween so as to seal said electrical component in said casing.

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**4,480,263**

## THREE-DIMENSIONAL TELEVISION SYSTEM AND TRANSMITTER SUITABLE THEREFOR

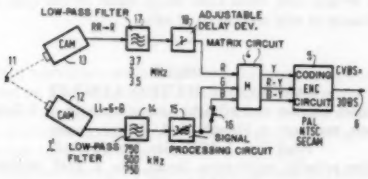
**Peter C. A. van Merode, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 10, 1982, Ser. No. 416,741**

**Claims priority, application Netherlands, Oct. 1, 1981, 8104475**

**Int. Cl.³ H04N** *9/60*

**U.S. Cl. 358—3** **8 Claims**




1. A three-dimensional television system comprising a transmitter having a picture pick-up arrangement, a receiver incorporating a picture display device, and a signal transmission system arranged between the transmitter and the receiver, the picture pick-up arrangement comprising first and second picture pick-up devices for recording a scene from different positions, the picture display device having a color picture display screen for displaying in two different colors, information intended for a left and a right eye, respectively, of an observer, the items of information being contained in first and second subpictures, respectively, which are shifted in the direction of line scan, which, when the overall picture is observed with two eyes through spectacles having glasses of different colors, results in a three-dimensional picture, characterized in that said signal transmission system is suitable for signal transmission coded in accordance with the PAL, NTSC or SECAM-standards for which purpose the transmitter comprises a matrix-coding circuit and the receiver comprises a decoding-matrix circuit, both incorporating signal channels for processing color difference signals and a luminance signal, an output of the first picture pick-up device in the picture pick-up arrangement being coupled to at least one input of the matrix-coding circuit via a first low-pass filter, an output of the second picture pick-up device being coupled to at least one further input of the matrix-coding circuit, the first low-pass filter having a bandwidth which is not more than the bandwidth of the color difference signal channels in the decoding-matrix circuit of the receiver.

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**4,480,264**

## CHARGE COUPLED DEVICE BASED SYSTEM AND METHOD FOR MEASURING PROJECTED FIGURES

**Robert A. Duschl, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Jun. 14, 1982, Ser. No. 388,029**

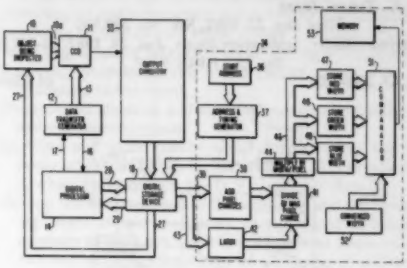
**Int. Cl.³ H04N** *9/62, 7/18, 7/02*

**U.S. Cl. 358—10** **7 Claims**

5. A method of measuring a figure comprising the steps of:

casting an image of said figure onto a CCD and transferring the CCD data to a digital storage device wherein the data are stored in pixel lines in accordance with the horizontal rows and vertical columns of pixels on said CCD;

summing the charge data from a number of adjacent pixels in a pixel line to provide a summed signal;



dividing said summed signal by a full pixel signal to obtain a mean signal; and

multiplying said mean signal by a dimension per pixel value to provide a dimension of said figure.

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**4,480,265**

## PAL COMB FILTER

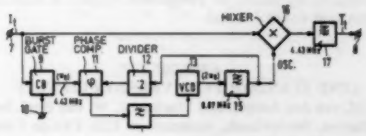
**Richard C. Spiero, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 30, 1982, Ser. No. 412,632**

**Claims priority, application Netherlands, Sep. 4, 1981, 8104101**

**Int. Cl.³ H04N** *9/535*

**U.S. Cl. 358—31** **7 Claims**



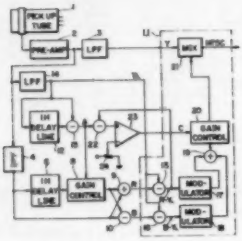

1. A PAL comb filter, for use in an apparatus for playing back video signals recorded in adjacent tracks on a record carrier for chroma cross-talk reduction by means of chroma carrier phase inversion, comprising a first and a second transmission path, input means for applying a PAL chroma signal to the two transmission paths, a delay network for delaying the PAL chroma signal in the first path relative to the PAL chroma signal in the other path, and a signal combination circuit for combining the PAL chroma signal in the second path and the PAL chroma signal delayed in the first path with the correct polarity relative to each other in such a way that the result of this combination is again a PAL chroma signal, characterized in that the delay network exhibits a time delay such that in the first path the PAL chroma signal is delayed by a time corresponding to one line of a video picture relative to the PAL chroma signal in the second path, and PAL-phase inversion means are included for inverting the PAL-phase of the signal in one of the two paths.

4,480,266

## METHOD AND APPARATUS FOR PREVENTING GENERATION OF FALSE COLOR SIGNALS IN COLOR TELEVISION CAMERAS

Takaaki Hashimoto, Noda, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,900
Claims priority, application Japan, Jun. 24, 1981, 56-96739
Int. Cl.³ H04N 9/07
U.S. Cl. 358—43 14 Claims



1. A method of preventing the occurrence of false color signals generated in a color television camera of the type in which at least two color components of a color image are spatially modulated within a pick up tube by color filter means, and the resulting modulated color signal is demodulated by utilizing a vertical correlation on a reproduced image thereby producing color signals, wherein the improvement comprises the steps of:

(1) delaying an unmodulated color image luminance indicative signal produced within said camera by one horizontal scanning period;

(2) combining said unmodulated signal and said delayed unmodulated signal derived by said step (1) to produce a difference signal indicative of the positions of color errors;

(3) combining said unmodulated signal with at least one of a plurality of demodulated color component signals to produce a color difference signal, adjusting the amplitude of said difference signal by said color difference signal and generating said amplitude adjusted difference signal as a control signal, within said camera; and

(4) suppressing said color component signals in accordance with said control signal.

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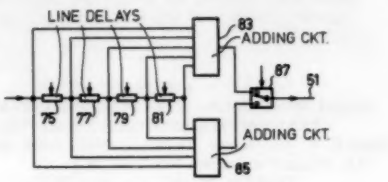
4,480,267

## LINE STANDARD CONVERSION CIRCUIT

Pieter M. van den Avoort, and Marinus C. W. van Buul, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 126,058, Feb. 29, 1980, abandoned, which is a continuation of Ser. No. 909,351, May 25, 1978, abandoned. This application Sep. 13, 1982, Ser. No. 417,783
Claims priority, application Netherlands, May 25, 1978, 7706512
Int. Cl.³ H04N 5/02
U.S. Cl. 358—140 4 Claims

1. A line standard conversion circuit for converting an interlaced television signal having a given number of lines per picture into a converted television signal having substantially double the number of lines per picture while maintaining the field frequency, said conversion circuit having a converter and a field interpolation circuit coupled to the converter for obtaining practically equal amplitudes of the information from each of two successive fields of the television signal to be converted into each of the lines of the converted television signal, wherein said field interpolation circuit includes a line averaging circuit which comprises a circuit for combining the sum of the amplitudes of the information from consecutive lines in one field with the sum of the amplitudes of the information from consecutive lines in a successive field which lines would interlace with said lines from said one field, the summed amplitude of the information from said one field being substantially equal to the summed amplitude of the information from said successive field, wherein the amplitude values of the signals of different lines in a first field are made to contribute to the sum in a




first fixed ratio while the amplitude values of the signals of different lines in a second field are made to contribute to the sum in a second and different fixed ratio, the sum of the coefficients in said first fixed ratio being equal to the sum of the coefficients in said second fixed ratio.

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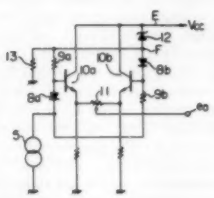
4,480,268

## GAMMA CORRECTION CIRCUIT

Michitaka Osawa, and Hitoshi Maekawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,716
Claims priority, application Japan, Jun. 3, 1981, 56-84410
Int. Cl.³ H04N 5/20
U.S. Cl. 358—164 4 Claims




1. A gamma correction circuit comprising:

(a) a signal source;

(b) a DC power source;

(c) first biasing means connected at one of its terminals to said signal source and at the other terminal to said DC power source and generating at a terminal intermediate between said terminals a voltage varying in linear relation to a signal applied from said signal source;

(d) second biasing means connected at one of its terminals to said signal source and at the other terminal to said DC power source and generating at a terminal intermediate between said terminals a voltage varying in non-linear relation to the signal applied from said signal source;

(e) a first transistor including a common terminal, an output terminal and an input terminal connected to the intermediate terminal of said first biasing means;

(f) a second transistor including a common terminal, an output terminal and an input terminal connected to the intermediate terminal of said second biasing means;

(g) signal combining means connected to the output terminals of said first and second transistors for combining the signals appearing at said output terminals; and

(h) voltage supplying means for supplying a first DC voltage to the common terminals of said first and second transistors and for supplyig to said other terminals of said first and second biasing means a second DC voltage deviating

from said first DC voltage in a direction tending to decrease the junction capacitance of each of said transistors.

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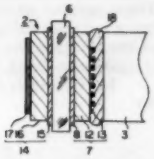
## 4,480,269
## TELEVISION CAMERA

**Nobuaki Yoshida, Tokyo; Yoshio Mori, Kawasaki; Kazushige Ooi, Sagamihara, and Sumio Sakai, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Danagawa, both of, Japan**

**Filed Jan. 31, 1983, Ser. No. 462,215**
**Claims priority, application Japan, Feb. 5, 1982, 57-16320**
**Int. Cl.³ H04N 3/06**
**U.S. Cl. 358—209** **6 Claims**



1. In a television camera including an imaging optical system, and an image pickup device arranged on an image forming plane of said imaging optical system for converting an image of a televised object from said imaging optical system to an electric signal, the improvement comprising:

(a) electro-optic light control means (2) arranged in an optical path of said imaging optical system, said electro-optic light control means being divided into a plurality of sections (13, 17) each thereof being responsive to the application of an electric signal to vary the light transmittance thereof; and

(b) drive means (4) electrically connected to said electro-optic light control means (2) to apply an electric signal to each of said plurality of sections in a predetermined sequence and thereby vary the light transmittance of said electro-optic light control means selectively and with time.

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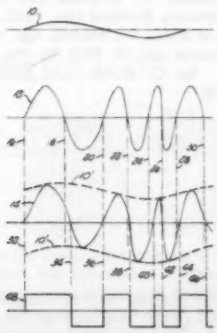
## 4,480,270
## AUDIO/VIDEO SIGNAL RECORDING METHOD

**Richard L. Wilkinson, El Toro, Calif., assignor to Discovision Associates, Costa Mesa, Calif.**

**Filed Oct. 28, 1981, Ser. No. 316,015**
**Int. Cl.³ H04N 9/491**
**U.S. Cl. 358—310** **6 Claims**



1. A method for recording audio and video information onto a recording medium having a predetermined useful frequency upper limit, $f_u$, comprising the steps of:

providing a composite video signal comprising a luminance video signal having a bandwidth $f_L$, and a color video signal having a predetermined nominal frequency, $f_c$=3.6 MHz, added to said luminance video signal;

providing an audio frequency signal having a bandwidth $f_d$;

providing a video carrier signal having a frequency $f_b$;

providing an audio subcarrier signal having a frequency $f_a$;

frequency modulating said video carrier signal with said composite video signal;

frequency modulating said audio subcarrier signal with said audio frequency signal;

selecting said video carrier signal frequency, $f_b$, and said audio subcarrier signal, $f_a$, such that $f_b-2f_c$ is greater than $f_a$ while the frequency $f_b+f_L$ is no greater than $f_u$;

shifting the zero crossings of the ascending and the descending edges of said modulated carrier signal in mutually opposite dependence upon said modulated audio subcarrier, and recording the shifted zero crossing of said modulated carrier signal on the recording medium;

providing a second audio frequency signal having a bandwidth $f_e$;

providing a second audio subcarrier signal having a frequency $f_g$;

frequency modulating said second audio subcarrier signal with said second audio frequency signal;

selecting said second audio subcarrier frequency $f_g$ such that $f_b-2f_c$ is greater than $f_g$, and such that $f_a-f_g>f_d+f_e$; and

adding said modulated first audio subcarrier and said modulated second audio subcarrier before performing said step of shifting the zero crossings.

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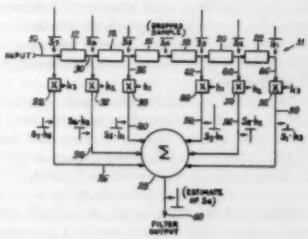
## 4,480,271
## DROPPED SAMPLE DATA RATE REDUCTION SYSTEM

**Charles H. Coleman, Jr., Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Nov. 2, 1981, Ser. No. 316,978**
**Int. Cl.³ H04N 9/49**
**U.S. Cl. 358—310** **29 Claims**



15. For use in a video recording system of the type which takes digital samples of an analog color video input signal at a sample rate of four times the chroma subcarrier frequency thereof, a method of converting the four times subcarrier frequency sample data rate data stream to a three times chroma subcarrier data rate data stream for recording and for thereafter reconstructing the data stream at the four times subcarrier frequency, comprising the steps of:

dropping every fourth sample from said four times subcarrier frequency data stream and reclocking the remaining unaltered samples at an effective three times subcarrier frequency data rate and recording the same on a recording medium;

reproducing said recorded data stream;

applying said reproduced data stream to a multi-term finite impluse response digital filter to generate an interpolated value from the digital samples that are applied thereto and inserting the generated interpolated value into said data

stream in locations between data samples where samples had been removed to thereby reconstruct said data stream at said four times subcarrier frequency data rate, the response of said filter being substantially unity at the chroma subcarrier frequency of said video signal and at approximately zero frequency.

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**4,480,272**

## SYSTEM OF RECORDING AND PLAYBACK OF DIGITALLY RECORDED SIGNALS, ESPECIALLY TELEVISION

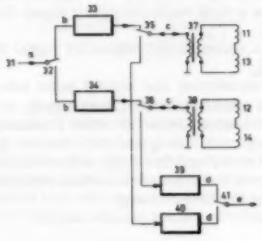
**Winfried Horstmann, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Mar. 30, 1982, Ser. No. 363,442**

**Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114273**

**Int. Cl.³ G11B** *5/00, 15/44*

**U.S. Cl. 360—8** **5 Claims**



1. A magnetic-tape recorder-playback apparatus for broadband digital signals having a plurality of diametral pairs of magnetic recording and playback heads mounted for obliquely scanning an advancing tape enveloping said headwheel by at least a half-turn of a helix for recording or pickup onto or from oblique tracks on said tape, said apparatus further comrising:

a headwheel carrying said plurality of diametral pairs of magnetic recording and playback heads in such a disposition that said heads are equally spaced around the circumference of said headwheel, and means for revolving said headwheel;

means for connecting the heads of each diametral pair of said heads to a common recording-and-playback channel;

means for guiding said tape to envelop said headwheel just enough to allow two heads of a diametral pair to touch the tape simultaneously twice per revolution;

first switching means for connecting each of said common recording-and-playback channels selectively to a corresponding recording channel and to a corresponding playback channel and at the same time making the apparatus ready for recording operation or playback operation according to whether said recording channel or said playback channel is connected;

time-base-changing means for each of said recording channels and playback channels for producing time-base expansion before recording and time-base compression after playback, in each case by a predetermined factor approximately equal to but not greater than the number of pairs of heads on said headwheel, said time-base-changing means including a digital signal storage unit for each of said recording channels, and write-in and read-out timing means, said first switching means being connected so as to cause said storage units to provide time-base expansion of signals in recording operation and time-base compression in playback operation, the write-in and read-out rates of said write-in and read-out timing means being determined so as to provide time-base expansion and compression factors just sufficiently less than the number of said pairs of heads, for preventing recording and playback while two heads of a diametral pair are in contact with the tape, and

second switching means for connecting the several recording channels respectively connected in recording operation to said head pairs cyclically to a signal input so as to distribute input signals for time-base expansion in said channels and for connecting the several playback channels respectively connected in playback operation to said head pairs cyclically to a signal output so as to sequence time-base-compressed signals of said channels to produce a combined flow of signals without overlaps or gaps at said output.

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**4,480,273**

## INFORMATION RECORDING DEVICE

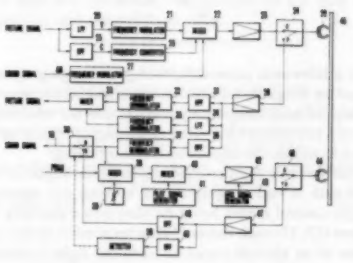
**Makoto Fujiki, Tokyo, and Makoto Takayama, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha**

**Filed Dec. 29, 1981, Ser. No. 335,339**

**Claims priority, application Japan, Jan. 7, 1981, 56-1334**

**Int. Cl.³ H04N** *5/78*

**U.S. Cl. 360—19.1** **4 Claims**



1. A signal reproducing apparatus comprising:

first reproducing means for reproducing a mixed signal consisting of a picture signal and a first sound signal from a first area of a tape-shaped recording medium;

second reproducing means for reproducing a second sound signal from a second area of the medium;

separating means for separating the first sound signal from the mixed signal reproduced by said first reproducing means; and

output means for selectively outputting the first sound signal and the second sound signal.

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**4,480,274**

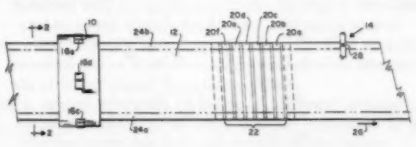
## RECORD VERIFY AND OPTIMIZE SYSTEM

**Charles H. Coleman, Jr., Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Continuation of Ser. No. 368,800, Apr. 16, 1982,. This application Apr. 15, 1983, Ser. No. 485,159**

**Int. Cl.³ G11B** *27/36, 15/02*

**U.S. Cl. 360—31** **51 Claims**



1. A method for enabling the monitoring of recording circuit performance in a rotary head recorder having a plurality of recording heads, comprising the steps of: (a) developing a periodic calibration signal of varying phase; (b) applying said calibration signal to one of said recording heads when said

recording head is positioned above an overlap area of a moving tape medium so as to cause said calibration signal to be recorded upon said overlap area; (c) subsequently detecting a component of said calibration signal recorded on said tape medium; (d) converting said component to a function of its unidirectional scalar magnitude; (e) sampling and holding the value of said function; (f) repeating steps (a)–(f) for a predetermined period of time; (g) constructing a value proportional to the amplitude of said recorded calibration signal from said sampled and held values; and (h) outputting a signal comensurate with said proportional value.

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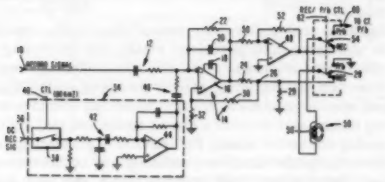
**4,480,275**

## CONSTANT CURRENT BIASED HEAD DRIVER

**John S. Fawkes, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Apr. 2, 1982, Ser. No. 364,737**
**Int. Cl.³ G11B *5/09, 5/02***
**U.S. Cl. 360—46** **12 Claims**



1. A circuit, comprising:
a reactive load;
a fixed AC bias source;
a record signal source;
constant current source means responsive to the two sources for supplying the reactive load with a constant current biased drive signal; and
a bridge means integral with the constant current source means and cooperative therewith to double the available signal supplied to the reactive load.

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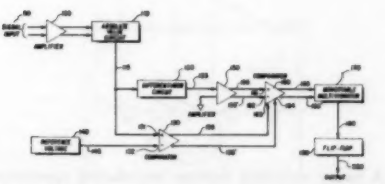
**4,480,276**

## APPARATUS FOR PEAK DETECTION IN MAGNETIC RECORDING

**Robert M. Batey, Eagle, and James D. Becker, Meridian, both of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 28, 1982, Ser. No. 402,507**
**Int. Cl.³ G11B *5/09***
**U.S. Cl. 360—46** **3 Claims**



1. An apparatus for locating the peaks of a signal recorded on a storage medium, said apparatus comprising:
a first circuit means responsive to a transducer signal for providing an output signal equivalent to the mathematical absolute value of the transducer signal;
a second circuit means coupled to the output of the absolute value circuit means for providing the time differentiation d/dt of the absolute value signal; and
a derivative comparator means coupled to the output of the differentiation circuit means for providing an output signal of a first logic state when the output of said differentiation circuit means is positive and said comparator output means is of an opposite logic state when the output of said differentiation circuit means is negative.

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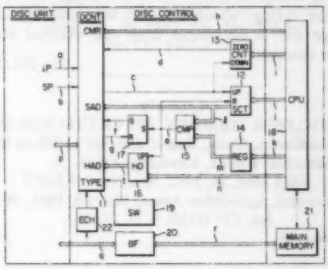
**4,480,277**

## INFORMATION PROCESSING SYSTEM

**Teruya Hara, and Kenzo Ina, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 9, 1982, Ser. No. 406,314**
**Claims priority, application Japan, Aug. 21, 1981, 56-130208**
**Int. Cl.³ G11B *5/012***
**U.S. Cl. 360—69** **11 Claims**



1. An information processing system operable with a magnetic disc, comprising:
a magnetic disc unit for reading and writing information to and from a magnetic disc;
disc control means for receiving an index signal, a sector signal and a detection signal from said magnetic disc unit and supplying a control signal to said magnetic disc unit;
processing means for supplying to said magnetic disc units necessary for information processing; and
instruction means for indicating the beginning and the end of information processing to said magnetic disc unit and providing necessary instructions to said processing means prior to information processing.

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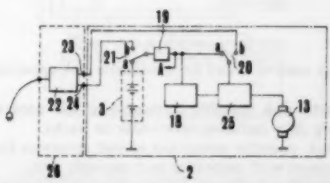
**4,480,278**

## RECORDING AND REPRODUCING APPARATUS FOR VIDEO SIGNALS

**Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha**

**Filed Feb. 9, 1982, Ser. No. 347,196**
**Claims priority, application Japan, Feb. 17, 1981, 56-21858**
**Int. Cl.³ G11B *15/46***
**U.S. Cl. 360—73** **34 Claims**



1. A video signal recording and reproducing apparatus, comprising:
(a) recording means for recording video signals on a recording medium;

(b) reproducing means for reproducing the video signals from the recording medium;
(c) moving means for moving the recording medium;
(d) connecting means for connecting an external electrical power source to the apparatus;
(e) internal means for connection to an internal electrical power source;
(f) generating means for producing a first constant voltage;
(g) first selective means for selectively supplying to said generating means first electrical power obtained from the internal electrical power source through said internal means and second electrical power obtained from the external electrical power source through said connecting means; and
(h) second selective means for selectively supplying to said moving means said first constant voltage and a second constant voltage which is higher than said first constant voltage and is obtainable from the external electrical power source.

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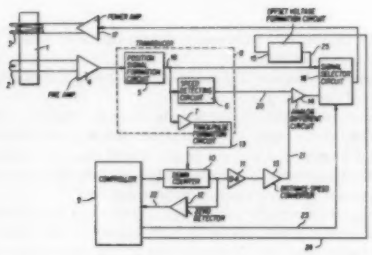
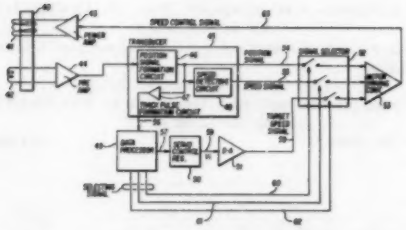
**4,480,279**

## MAGNETIC DISK MEMORY TRACK CHANGE SERVO

**Yasuichi Hashimoto, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Mar. 24, 1982, Ser. No. 361,248**
**Claims priority, application Japan, May 15, 1981, 56-72262**
**Int. Cl.³ G11B *5/55, 21/08***
**U.S. Cl. 360—78** **2 Claims**





1. A disk control circuit for a magnetic disk apparatus comprising:
a magnetic disk operably connected to said apparatus for storing data, including servo data on tracks;
a carriage, operably connected to said apparatus for radial movement with respent to said magnetic disk;
a first magnetic head operably connected to said carriage for reading data from and writing data to said magnetic disk;
a second magnetic head, operably connected to said carriage, for reading said servo data;
a motor operably connected to said carriage, for moving said carriage;
motor driving circuit means, electrically connected to said motor, for driving said motor;
convertor circuit means, electrically connected to said first head and said second head, for converting said servo data read out from said second head to a position signal to indicate the position of said first head with respect to said magnetic disk, to a speed signal to indicate the speed of said first head, and to a track pulse to indicate passing of said first head over a track of said magnetic disk;
processing means, electrically connected to said converter circuit means, for generating target speed information, said target speed information corresponding to the distance between a target track and a track which said first head is positioned above whenever said data processor receives said track pulse, to control the speed of said first head, and for generating track offset information to control the position of said first head;
a servo control register means, electrically connected to said processing means, for storing said track speed information and said track offset information from said processing means;
a digital to analog convertor means, electrically connected to said servo control register means, for converting said track speed information and said track offset information from said servo control register means to analog signals;
signal selecter means, electrically connected to said processing means, said convertor circuit means and said digital to analog convertor means, for selectively generating motor control signals based on predetermined combinations of said speed signal, said position signal and said analog signal from said digital to analog convertor; and
a motor drive controller means, electrically connected to said signal selector means and said motor driving circuit means, for generating and coupling to said motor driving circuit means motor drive control signals in response to said motor control signals.

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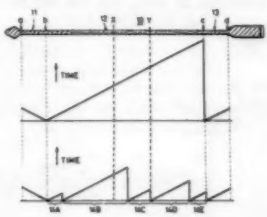
**4,480,280**

## ROTARY RECORDING MEDIUM REPRODUCING APPARATUS ADDRESS SEARCH

**Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama; Kenji Yoshihara, Chiba, and Susumu Sakakibara, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan**

**Filed Aug. 2, 1982, Ser. No. 403,958**
**Claims priority, application Japan, Aug. 18, 1981, 56-128882**
**Int. Cl.³ G11B *21/10***
**U.S. Cl. 360—78** **7 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium recorded with a program information signal and different kinds of address signals having mutually different predetermined codes in correspondence with said program information signal within a program information signal recorded section, said reproducing apparatus comprising:
a reproducing element for reproducing recorded signals from said rotary recording medium;
moving means for moving said reproducing element along a radial direction of said rotary recording medium;

address signal detecting means for detecting address signals from signals reproduced by said reproducing element; and driving voltage generating means set with an address signal to be searched, for generating a driving voltage in accordance with the kind of set address signal, and supplying the driving voltage thus generated to said moving means, said moving means moving said reproducing element at a speed in accordance with the kind of said address signal.

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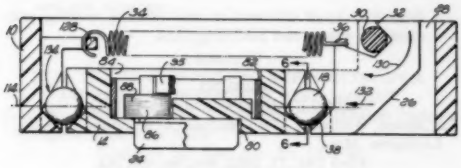
**4,480,281**

## SYSTEM FOR MOUNTING MAGNETIC TRANSDUCER MEANS ON OPPOSITE SIDES OF A FLEXIBLE ROTATING MAGNETIC DISC

**Gill Cantwell, 2434 Purdue Ave. #17, Los Angeles, Calif. 90064**

**Filed Sep. 30, 1982, Ser. No. 431,478**
**Int. Cl.³ G11B *5/48***
**U.S. Cl. 360—104** **16 Claims**



1. Apparatus for supporting a pair of magnetic transducers one on each side of a pliant magnetic recording medium and in operative relationship therewith comprising:

(A) a pair of support arms disposed for receiving a magnetic recording medium therebetween;

(B) a pair of magnetic transducer means;

(C) first means for mounting one of said transduce means for pivotal movement only about a first single axis substantially parallel to a plane defined by said recording medium on one of said support arms;

(D) second means for mounting the other of said transducer means for pivotal movement only about a second single axis substantially parallel to a plane defined by said recording medium on the other of said support arms; and

(E) said first axis being angularly disposed with respect to said second axis.

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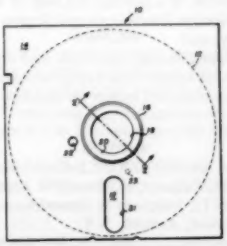
**4,480,282**

## STABILIZED LOCATING RING FOR A FLEXIBLE DISK

**George W. Brock, Los Altos Hills, and Alfred W. Conner, Palo Alto, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.**

**Filed Feb. 22, 1982, Ser. No. 350,817**
**Int. Cl.³ G11B *5/016, 5/82, 3/70, 5/84***
**U.S. Cl. 360—135** **10 Claims**



1. In a flexible disk including a thin film disk base substrate material coated with at least one layer of a magnetic recording material and including a central aperture therethrough for receiving a disk drive spindle, the improvement comprising:

a stablilized locating ring mounted concentrically about said central aperture on one disk surface, the ring being formed of a non-malleable material having isotropic thermal and humidital expansion characteristics, and having a thickness which is similar to a thickness of said base substrate material, the ring further having an inside diameter which is slightly smaller than said disk central aperture diameter and an outside diameter which is less than the radial distance from a central axis of the disk to a disk index aperture, whereby the interior aperture of the locating ring engages the spindle for a precise fit.

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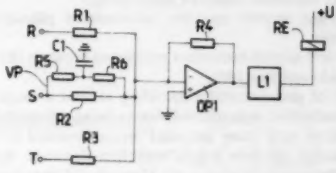
**4,480,283**

## PROCEDURE AND MEANS FOR MONITORING THE PHASE SEQUENCE IN A THREE-PHASE NETWORK

**Matti Kähkipuro, and Heimo Mäkinen, both of Hyvinkää, Finland, assignors to Elevator GmbH, Baar, Switzerland**

**Filed Jun. 24, 1981, Ser. No. 276,947**
**Int. Cl.³ H02H *3/26***
**U.S. Cl. 361—76** **5 Claims**




3. A circuit for monitoring the phase sequence in a three-phase network having a summing resistor in each phase, comprising an operator amplifier circuit for forming a sum of the phases, a window comparator for monitoring the remaining in zero state of said circuit, said comparator having an output signal controlling a control member; one of said phases lagging by 60 degrees, and another phase leading said lagging phase by 120 degrees, a delay circuit in said one phase, said delay circuit being in parallel with said lagging phase's summing resistor, and the summing resistor incorporated in said other phase being suitably smaller in value than the summing resistors in the other phases.

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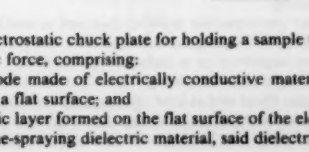
**4,480,284**

## ELECTROSTATIC CHUCK PLATE

**Toru Tojo, Yamato; Ichiro Mori, Tokyo, and Shunichi Sano, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Sep. 29, 1982, Ser. No. 428,341**
**Claims priority, application Japan, Feb. 3, 1982, 57-15875**
**Int. Cl.³ H01F *13/02***
**U.S. Cl. 361—234** **4 Claims**




1. An electrostatic chuck plate for holding a sample with an electrostatic force, comprising:

an electrode made of electrically conductive material and having a flat surface; and

a dielectric layer formed on the flat surface of the electrode by flame-spraying dielectric material, said dielectric layer

having a flat surface to be electrically charged to electrostatically attract a sample;

wherein at least said flat surface of said dielectric layer is impregnated with plastic material.

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**4,480,285**

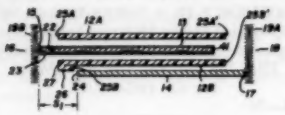
**CAPACITOR**

**Frederick W. Grahame, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.**

**Filed Dec. 15, 1982, Ser. No. 449,896**

**Int. Cl.³ H01G** *1/14, 4/06*

**U.S. Cl. 361—306** **21 Claims**



1. An electrical capacitor comprising:

first and second opposite, substantially planar capacitor ends;

first and second electrodes positioned between the planes of said capacitor ends;

each of said electrodes including at least a single layer of conductive material, said layers being substantially parallel to each other and each being bounded by first and second opposite edges, said first-electrode layer being substantially normal to the plane of said first capacitor end and having its first edge disposed in said first end plane, said first edge of said second-electrode layer being recessed a first predetermined distance from said first end plane;

a layer of dielectric material positioned between said electrode layers and substantially parallel thereto including first and second opposite borders substantially parallel to said first and second end planes respectively;

a fold in said dielectric material including said first border, said fold being positioned substantially within said predetermined recess distance of said first edge of said second-electrode layer from said first end plane; and

first and second electrical connecting means for connecting to said first and second electrodes respectively, at least said first connecting means comprising a conductive coating applied to said first capacitor end to make electrical contact with said first edge of said first-electrode layer;

said predetermined recess distance having a selected magnitude, and said fold being adapted to shield said second electrode from stray particles attributable to the application of said conductive coating to said first capacitor end.

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**4,480,286**

**CAPACITOR CASE INSULATION AND METHOD OF INSTALLATION**

**Boyce D. Whitman; Donald G. Beltz, both of Pickens, and Morris T. Reese, Taylors, all of S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.**

**Filed Jan. 25, 1982, Ser. No. 342,580**

**Int. Cl.³ H01G** *4/22, 4/38*

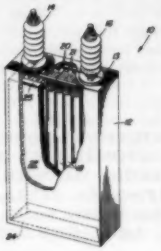
**U.S. Cl. 361—314** **5 Claims**

1. An electrical capacitor comprising:

a housing;

at least one capacitor winding disposed in said housing, said capacitor winding including at least one pair of electrode films separated by a dielectric spacer film;

a synthetic resin insulating film disposed in at least sixteen layers about said at least one capacitor winding as the only insulation between said capacitor and said housing, said insulating film having a thickness of not greater than 10 mils and a dielectric strength of greater than 600 volts per mil; and



a dielectric liquid disposed in said housing wetting said dielectric spacer and insulating films.

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**4,480,287**

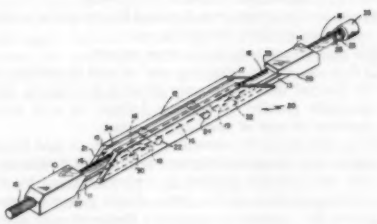
**MODULE RETAINER APPARATUS**

**Kai Jensen, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed Dec. 27, 1982, Ser. No. 453,264**

**Int. Cl.³ H05K** *7/20*

**U.S. Cl. 361—388** **39 Claims**



1. A module retainer comprising:

a center body including a first sloping end and a second sloping end;

a slot in each of said sloping ends of said center body;

a first end body including a keying guide extending from a lower portion of a sloping end face of said first end body for insertion into said first sloping end slot of said center body;

a second end body including a keying guide extending from a lower portion of a sloping end face of said second end body for insertion into said second sloping end slot of said center body; and

a screw extending through said first end body, said center body and said second end body, said second end body comprising a threaded means for tightening said screw.

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**4,480,288**

**MULTI-LAYER FLEXIBLE FILM MODULE**

**Charles E. Gazdik, Endicott, and Donald G. McBride, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 27, 1982, Ser. No. 453,443**

**Int. Cl.³ H05K** *1/00;* **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00*

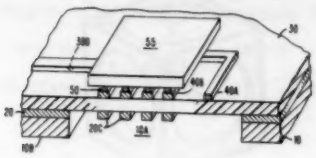
**U.S. Cl. 361—398** **2 Claims**

1. An electronic package which includes a substrate which has an opening therein,

two-sided flexible film circuitry covering said opening,

said two-sided flexible film circuitry including a base layer of

polyimide having circuitry on each side thereof, the circuitry on the two sides of said polyimide being interconnected by means of etched vias, and



an integrated circuit chip mounted on said flexible circuitry above said opening, whereby said flexible film circuity compensates for any thermal mismatch between said chip and said substrate.

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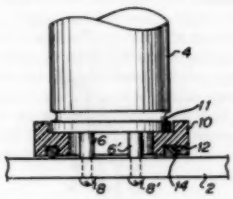
**4,480,289**

**ELECTRICAL COMPONENT SUPPORTED ON A SUPPORT MEMBER BY A RING MOUNT**

**John W. Huffman, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Sep. 29, 1983, Ser. No. 537,780**
**Int. Cl.³ H05K *7/08***
**U.S. Cl. 361—403** **4 Claims**



1. In combination, an electrical component having terminal means at a first end thereof, a support member for said electrical component having at least one opening therethrough, a ring member disposed on said support member having an internal shoulder portion on which said first end of said electrical component rests with said terminal means extending therethrough and being in alignment with said opening in said support member, and fastening means passing through said opening in said support member and engaging said terminal means for causing said electrical component to draw said ring member against said support member, thereby securing said electrical component to said support member.

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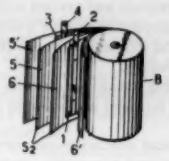
**4,480,290**

**ELECTROLYTIC CAPACITOR INCLUDING A COMPOSITE SEPARATOR BETWEEN THE ANODE AND THE CATHODE THEREOF**

**Jean Constanti, Poissy, and Pierre Grandadam, Paris, both of France, assignors to Les Condensateurs Sic Safco, Colombes, France**

**Continuation-in-part of Ser. No. 169,403, Jul. 16, 1980,. This application May 9, 1983, Ser. No. 493,006**
**Claims priority, application France, Jul. 17, 1979, 79 18496; Dec. 30, 1982, 82 22115**
**Int. Cl.³ H01G *9/00*; H02B *9/00***
**U.S. Cl. 361—433** **9 Claims**

1. An electrolytic capacitor comprising:
(a) an anode;
(b) a cathode; and
(c) a separator located between said anode and said cathode, wherein the separator is formed by the association of at least one film of porous polymer and at least one sheet of absorbant paper impregnated with an electrolyte, and



wherein said film of porous polymer is disposed against said anode.

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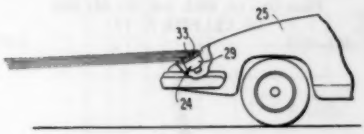
**4,480,291**

**HEADLIGHTS FOR STREAMLINED VEHICLES**

**William M. Dranginis, 7915 Carrie La., Manassas, Va. 22110**

**Filed Sep. 14, 1983, Ser. No. 532,004**
**Int. Cl.³ B60Q *1/00***
**U.S. Cl. 362—80** **15 Claims**



1. A headlight for streamlined vehicles comprising in combination a sloping upper forward vehicle surface sloping forwardly and downwardly at an acute angle to the horizontal, a headlight reflector body portion including an internal illumination source and a frontal lens secured to the reflector body portion, the headlight being mounted with its optical axis substantially normal to said sloping surface and said frontal lens substantially flush therewith, and light deflector means held within the headlight rearwardly of the frontal lens and deflecting light rays from the optical axis of the headlight through the frontal lens and onto a roadway ahead of the vehicle on which the headlight is mounted at a required angle near the horizontal and in a required light pattern with proper light intensity.

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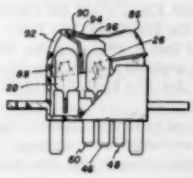
**4,480,292**

**LIGHT ASSEMBLY**

**Maurice E. Schuder, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.**

**Filed Mar. 31, 1982, Ser. No. 364,008**
**Int. Cl.³ F21V *33/00***
**U.S. Cl. 362—95** **4 Claims**



1. A light assembly comprising
(a) a housing having a base and an open end,
(b) a cover pivotally carried in said open end,

(c) a pair of electrical terminals carried within said housing and extending outside thereof,

(d) a first retaining means electrically connected to said pair of electrical terminals and carried within said housing on said base and adapted to receive a first light means,

(e) a third electrical terminal carried within said housing and extending outside thereof,

(f) second retaining means electrically connected to said third electrical terminal and adapted to receive a second light means,

(g) a fixed electrical contact blade carried by said second retaining means and a movable electrical contact blade carried by said first retaining means,

(h) an electrical contact bar carried by said cover continually engaging said fixed electrical contact blade and selectively engaging said movable electrical contact blade upon actuation of said cover, and

(i) at least one window in said housing.

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**4,480,293**

## LIGHTED SWEAT SHIRT

**Peggy S. Wells, Sand Springs, Okla., assignor to PSW, Inc., Sand Springs, Okla.**

**Filed Oct. 14, 1983, Ser. No. 541,886**
**Int. Cl.³ F21L *15/14***
**U.S. Cl. 362—108** **9 Claims**

1. An illuminated object comprising a first surface to be illuminated, a second surface in back to back relation with respect to the first surface, flexible circuit board means disposed in the proximity of the second surface and having an electrical circuit impressed thereon, light emitting diode means positioned in the proximity of the first surface and extending therethrough into removeable connection with the circuit board means for securing the circuit board means to the second surface and for operable electrical connection with the electrical circuit for activation thereby.

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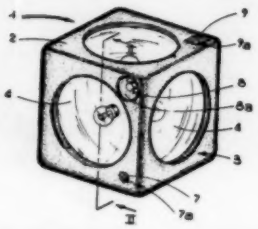
**4,480,294**

## LAMP THAT CAN BE THROWN

**Alberto Carboni, Via Froaticelli, 21 - Forli' , Italy**

**Filed Dec. 6, 1982, Ser. No. 447,122**
**Claims priority, application Italy, Sep. 20, 1982, 14741/82[U]**
**Int. Cl.³ F21L *7/00, 9/00***
**U.S. Cl. 362—184** **4 Claims**

1. A lamp that can be thrown, comprising a casing having a plurality of sides assembled in the shape of a polyhedron, made of shockproof material, one of said sides being formed with an indentation, a plurality of transparent screens respectively mounted in said sides in recessed relation thereto, at least one source of light mounted firmly in the inside of the casing switch means mounted in said indentation for actuating said source of light, said source of light, when actuated, radiating through each of said screens, and said lamp, when thrown with said switch so actuated, providing illumination of the surroundings simultaneously in a plurality of directions through said screens.



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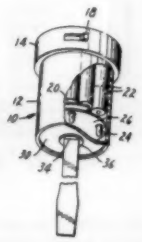
**4,480,295**

## WORK SURFACE LIGHT

**Frank J. Shuster, Star Rte. 4, Box 251A, Hibbing, Minn. 55746**

**Filed Mar. 21, 1983, Ser. No. 477,639**
**Int. Cl.³ F21L *7/00***
**U.S. Cl. 362—206** **1 Claim**



1. An illuminator attachment adapted to be selectively added to various tools such as screwdrivers, drill bits and socket extension bars, all of which could have different cross-section diameters of elogated shafts that slide through the attachment, to provide illumination of a workplace, comprising:

(a) a housing having a generally centrally located longitudinal aperature through said housing for receiving the shaft of the tool, said housing is generally cylindrically shaped about a longitudinal axis and includes two end plates, one at each end of said housing, each of said end plates including plate aperatures concentric with said longitudinal axis of the housing;

(b) battery means within said housing for providing energy to the apparatus;

(c) light means for providing illumination of the workplace;

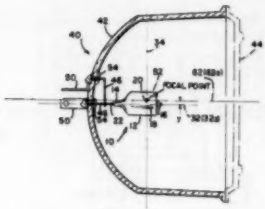
(d) switch means electrically interconnected with said light means and said battery means for selectively illuminating said light means; and

(e) two resilient flexible grommets, each having a center opening, one of each grommets inserted into each of said aperatures, wherein the resiliency of said grommets adapts to various cross-sectional diameters of the elongated shafts of the various tools inserted through said center openings in said grommets to allow the illuminator attachment to receive shafts of varying diameters so that said illuminator attachment may be selectively added to various tools.

## 4,480,296
## TWO-FILAMENT LAMP FOR AUTOMOBILE HEADLIGHT

**Peter R. Gagnon, Georgetown; John J. Lumia; Stephen J. Leadvaro, both of Salem, and James C. Morris, Wakefield, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Dec. 28, 1981, Ser. No. 335,135**
**Int. Cl.³ F21M *3/30***
**U.S. Cl. 362—211** **11 Claims**

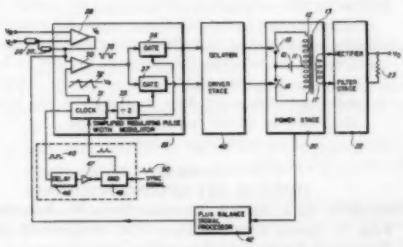


1. An incandescent lamp comprising: an hermetically sealed light-transmitting envelope having a base portion at one end; a first filament having a linear axis disposed in said envelope substantially orthogonal to a first plane containing the axis of said lamp, with the center of said first filament length having a predetermined finite offset from said first plane; and a second filament having a linear axis disposed in said envelope substantially parallel to the axis of said lamp on the opposite side of said first plane from at least the major portion of said first filament, said first and second filaments being spaced apart and disposed on opposite sides of a second plane containing the axis of said lamp and lying orthogonal to said first plane, and the axis of said second filament orthogonally intersecting a plane containing the axis of said first filament.

## 4,480,297
## SYNCHRONIZING CIRCUIT FOR PUSH-PULL INVERTER

**P. R. K. Chetty, and Donald G. Fair, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Mar. 31, 1983, Ser. No. 480,688**
**Int. Cl.³ H02M *3/335***
**U.S. Cl. 363—26** **9 Claims**



1. In a push-pull inverter having a DC source, an output transformer with a center tapped primary winding and a secondary winding, a pair of switches, each connected between said DC source and one-half of said primary winding and a pulse width modulator for developing switch control signals alternately closing said switches to generate an alternating output in said secondary winding, the pulse width modulator including a clock generating a ramp signal, an error circuit comparing the output of said transformer with a reference to generate an error signal and a switch pulse generator responsive to said ramp and error signals to develop said switch control signals,

a circuit for synchronizing said pulse width modulator, comprising:

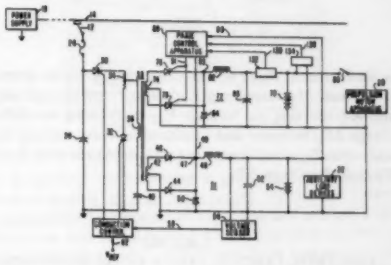
a source of synchronizing signals; and

a gating circuit having an input connected to said source of synchronizing signals and an output connected with said clock to synchronize the clock, said gating circuit blocking synchronizing signals which would cause an unbalance in the duty cycle of said switches and saturation of the output transformer.

## 4,480,298
## MULTIPLE OUTPUT DC-TO-DC VOLTAGE CONVERTER APPARATUS

**Warren C. Fry, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 25, 1983, Ser. No. 461,042**
**Int. Cl.³ H02M *3/315***
**U.S. Cl. 363—28** **7 Claims**



1. In signal converter apparatus operative with an input power source for energizing a first load and a second load, the combination of

first switch means coupled with the input power source;

first signal supply means including a transformer having a primary winding connected to the first switch means and a plurality of secondary windings, with one of the secondary windings energizing the first load with a first output signal;

first control means operative with the first switch means and responsive to the first output signal for determining the actual voltage of the first output signal by controlling the frequency of the first output signal;

second signal supply means including second switch means coupled with another of the secondary windings and energizing the second load with a second output signal having said frequency; and

second control means operative with the second switch means and being responsive to a control signal determined by the first output signal and at least one of the current and voltage of the second output signal for determining the ON time phase relationship of the second switch means to control the second output signal.

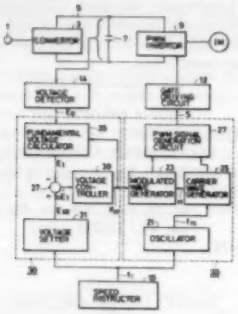
## 4,480,299
## METHOD OF CONTROLLING THE OUTPUT VOLTAGE OF A PULSE WIDTH MODULATION INVERTER

**Nobuyoshi Muto; Keijiro Sakai; Yasuo Matsuda, all of Hitachi, and Kenji Nandoh, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 14, 1982, Ser. No. 449,667**
**Claims priority, application Japan, Dec. 15, 1981, 56-202996**
**Int. Cl.³ H02M *1/12***
**U.S. Cl. 363—41** **6 Claims**

1. In a method of controlling the output voltage of a pulse width modulation inverter by effecting on-off control of

switching elements making up the inverter on the basis of a pulse width modulation signal obtained by comparing the level of a carrier wave with that of a modulated wave, the improvement comprising the following steps: determining the amplitude ratio $K_H$ of said carrier wave and said modulated wave; detecting a d.c. voltage $E_D$ input of said interver; calculating



the fundamental wave voltage $E_1$ of said inverter output from the product of a function $g(K_H)$ determined by said amplitude ratio $K_H$ and said d.c. voltage $E_D$; calculating the differential voltage $\Delta E_1$ between said fundamental wave voltage $E_1$ and a fixed value $E_{1R}$; and correcting said amplitude ratio $K_H$ by said differential voltage $\Delta E_1$.

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**4,480,300**

## CONTROL CIRCUIT FOR A DC-AC CONVERTER

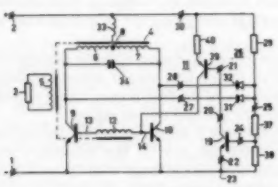
**Meerten Luursema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 5, 1982, Ser. No. 405,669**

**Claims priority, application Netherlands, Sep. 14, 1981, 8104222**

**Int. Cl.³ H02M 7/537**

**U.S. Cl. 363—134** **9 Claims**



1. A control circuit for two semiconductor switches of a d.c.-a.c. converter, which semiconductor switches are controlled in push-pull and each comprise a main current path and a control input, said main current paths being conductive alternately when a control signal from the control circuit appears on the control input of the relevant semiconductor switch, the control circuit comprising: a control element for adjusting the control signal to a desired value, a comparator circuit having an output connected to the control element, one input connected to a reference voltage, and the other input connected to an output of an analog OR-gate having a first input connected to one semiconductor switch main current path and a second input connected to the other semiconductor switch main current path, the comparator circuit comparing at least a part of a residual voltage appearing across the conductive main current path with the reference voltage and in the case of a deviation controlling the control element so as to obtain a desired value of the residual voltage.

**4,480,301**

## METHOD AND APPARATUS FOR CONTROLLING A PULSED FREQUENCY CONVERTER

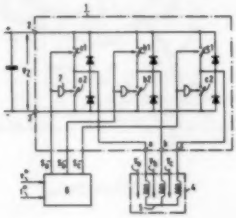
**Gerhard Pfaff, Erlangen, and Albert Wick, Hagenau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Jul. 19, 1982, Ser. No. 399,249**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131344**

**Int. Cl.³ H02M 7/515**

**U.S. Cl. 363—137** **14 Claims**



1. A method for driving a frequency converter, which comprises:

providing a DC voltage across DC input terminals of the frequency converter;

forming a plurality of addressing signals;

connecting the DC input voltage to phase outputs of the frequency converter in response to the addressing signals, said DC input voltage producing one of a plurality of discrete space vectors at a load connected to the phase outputs for each respective combination of the plurality of addressing signals; and

quasi-continuously controlling the output voltage in response to voltage reference values, a step which further comprises:

forming a variable voltage space vector composed of the voltage reference values;

determining which two discrete space vectors are adjacent to the variable voltage space vector;

determining components of said variable voltage space vector that coincide with the adjacent discrete space vectors, said components being formed as the control signals;

generating a running time signal;

comparing the running time signal against the control signals in order to produce a switching signal for switching at least one addressing signal from one state to another; and

addressing the adjacent discrete space vectors for respective time durations that correspond to the control signals, said addressing done in a pre-selected sequence after the start of the running time signal.

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**4,480,302**

## OPTICAL RECORDING MEDIA

**Franklin D. Kalk; Boris J. Muchnik; Doyle W. Johnston, and Fred W. Spong, all of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.**

**Filed Sep. 29, 1982, Ser. No. 427,326**

**Int. Cl.³ G01D 15/32**

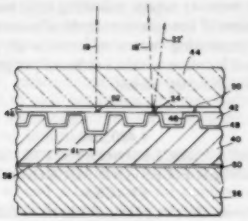
**U.S. Cl. 346—135.1** **12 Claims**

1. An optical recording medium comprising:

first and second generally planar members, said first planar member being transparent to radiant energy and said second planar member having a plurality of grooves therein that define a plurality of sealed chambers when said planar members are placed in a confronting relationship; and

a radiant energy-sensitive recording layer overlaying the

inwardly facing side of said first member in at least the region of said chambers; and means for holding said first



and second planar members in said confronting relationship.

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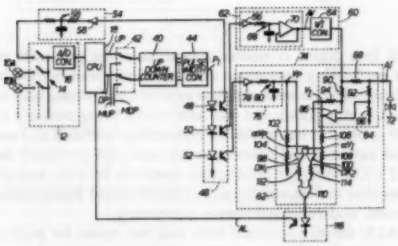
**4,480,303**

## DIGITAL CONTROLLER OF ANALOG SYSTEMS CONTAINING ISOLATION CIRCUITRY AND ERROR DETECTION CIRCUITRY

**Keisuke Takada, Kodaira, and Hiroo Okuhara, Inagi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Jun. 18, 1982, Ser. No. 389,960**
**Claims priority, application Japan, Aug. 12, 1981, 56-126409**
**Int. Cl.³ G05B *13/00*; G06B *15/00***
**U.S. Cl. 364—138** **3 Claims**



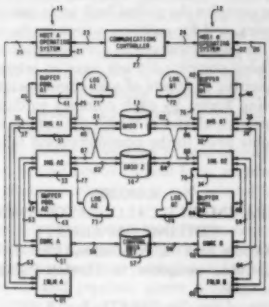
1. A digital controller comprising:
a plurality of detectors producing analog signals;
an analog input circuit for converting the analog signals to corresponding digital signals;
a central processor unit for processing said digital signals;
counter means for counting an output signal of said central processor unit;
a pulse width converter circuit for producing a pulse signal having a pulse width corresponding to the content of said counter means;
first coupling means for producing a first signal responsive to the pulse signal of said pulse width converter circuit;
a manipulation signal generation circuit for producing an analog manipulation signal responsive to the first signal of said first coupling means;
a monitor circuit for producing an abnormality detection signal if the ratio between the first signal and the manipulation signal is higher than a predetermined value;
second coupling means for producing a second signal responsive to the abnormality detection signal of said monitor circuit and applying the second signal to said central processor unit; and
a feedback circuit for applying the first signal to said analog input circuit.

**4,480,304**

## METHOD AND MEANS FOR THE RETENTION OF LOCKS ACROSS SYSTEM, SUBSYSTEM, AND COMMUNICATION FAILURES IN A MULTIPROCESSING, MULTIPROGRAMMING, SHARED DATA ENVIRONMENT

**Clarence A. Carr, San Jose; Robert L. Huddleston, Sunnyvale, and Jimmy P. Strickland, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 6, 1980, Ser. No. 194,506**
**Int. Cl.³ G06F *15/00, 15/16***
**U.S. Cl. 364—200** **8 Claims**



1. A method for operating a general purpose computing system including at least two central electronic complexes interconnected by a communication link and sharing access to at least one data base having a plurality of data resources, the method inhibiting access to data resources that may be inconsistent due to failure in a complex or in the communication link, comprising the steps of:
responsive to failure of a first complex, operating the second complex to inhibit access by the second complex on behalf of a transaction to data resources in which said first complex had an interest prior to the complex failure by terminating said transaction and backing out any changes to said data base made by said transaction;
responsive to failure of the communication link, operating each complex to inhibit access thereby on behalf of a transaction to data resources of a congruence class in which it did not have private use prior to the link failure by terminating said transaction and backing out any changes to said data base made by said transaction; and
responsive to failure of a first complex, retaining in the lock control structure of a second complex the congruence classes in which the first complex had an interest prior to the complex failure until completion of restart/recovery processing for all subsystems denoted in the lock control structure of the second complex as identified to the first complex.

8. A computing system adapted for inhibiting access to shared data resources that may be inconsistent due to a failure, comprising:
first and second central electronic complexes;
communication means for interconnecting said complexes;
data storage means for storing data resources for sharing by said complexes;
each said complex including:
a plurality of management subsystems for accessing said data resources;
a lock manager for selectively granting, waiting, and denying locks for data resources to said subsystems;
each said lock manager including:
global hash table means for denoting for each congruence class the interest state of each complex;
subsystem list means for denoting each subsystem associated with a lock manager; and

held lock means for denoting resource locks held by subsystems in the complex of the lock manager; and

operating means in each complex for controlling the operation of the computing system for retaining locks for data resources selectively across failures of a complex, of a subsystem, and of the communication means; the operating means being

(1) responsive to a failure of a first subsystem for retaining all locks held by said first subsystem until released by restart or recovery thereof, and for granting locks for enabling access by the other subsystems only to data resources not locked by said first subsystem;

(2) responsive to failure of a complex for retaining in the other complex the global hash table entries of the failed complex, and for enabling access by the other complex only to data resources of a congruence class in which the failed complex did not have an interest; and

(3) responsive to failure of said communication means for enabling access by each complex to data resources in congruence classes in which the complex had a private use state prior to the communication failure.

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**4,480,305**

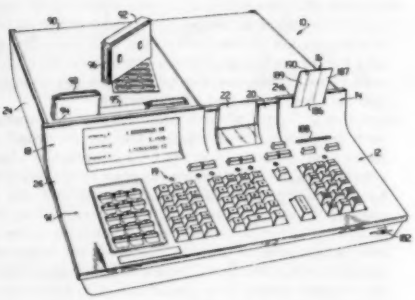
## PROGRAMMABLE CALCULATOR INCLUDING EDITING CAPABILITY

**Robert E. Watson; Jack M. Walden, and Charles W. Near, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 046,871, Jun. 8, 1979, , which is a continuation of Ser. No. 850,333, Nov. 10, 1977, abandoned, which is a division of Ser. No. 535,750, Dec. 23, 1974, Pat. No. 4,063,221, which is a division of Ser. No. 153,437, Jun. 15, 1971, Pat. No. 3,859,635. This application Jan. 22, 1981, Ser. No. 227,453**

**Int. Cl.³ G06F *15/02***

**U.S. Cl. 364—200** **17 Claims**



1. An electronic calculator comprising:

keyboard input means for entering information into the calculator;

first memory means into which information, including a series of program steps, may be written and from which information may be read;

second memory means for storing routines and/or subroutines to be executed by the calculator in performing selected functions;

processing means, coupled to the keyboard input means and first and second memory means, the processing means being responsive to information from the keyboard input means or the first memory means and to operating states within the calculator itself for selectively executing one or more of the routines and/or subroutines stored in the second memory means to perform selected functions employing information from one or both of the keyboard input and first memory means; and

output display means, coupled to the processing means, for providing a visual output indication of the results of functions performed by the calculator;

the keyboard input means including insertion control means;

the second memory means including logic means responsive to actuation of the insertion control means for conditioning the processing means to insert a program step at a designated location within a series of program steps stored in the first memory means.

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**4,480,306**

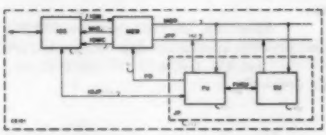
## DIGITAL DATA PROCESSING SYSTEM USING UNIQUE ALU REGISTER FILES AND MICRO-INSTRUCTION STACKS

**Brett L. Bachman, Boston, Mass.; Richard A. Belgard, Saratoga, Calif.; David H. Bernstein, Ashland; Richard G. Bratt, Wayland, both of Mass.; Gerald F. Clancy, Saratoga, Calif.; Edward S. Gavrin, Lincoln, Mass.; Thomas M. Jones, Chapel Hill, N.C.; Lawrence H. Katz, Oregon City, Oreg.; Craig J. Mundie, Cary, N.C.; John F. Pilat, Raleigh, N.C.; Stephen I. Schleimer, Chapel Hill, N.C.; Steven J. Wallach, Saratoga, Calif.; Walter A. Wallach, Jr., Raleigh, and Douglas M. Wells, Chapel Hill, both of N.C., assignors to Data General Corporation, Westboro, Mass.**

**Filed May 22, 1981, Ser. No. 266,425**

**Int. Cl.³ G06F *9/22***

**U.S. Cl. 364—200** **9 Claims**



1. In a digital computer system including processor means for performing operations upon operands, memory means for storing said operands and instructions for directing said operations, said operands and said instructions being uniquely identified as objects, bus means for conducting operands and instructions between said memory means and said processor means, and I/O means for conducting operands between said digital computer system and devices external to said digital computer system, said processor means comprising:

ALU means connected from said bus means for performing operations in accordance with instructions,

addressing means connected to said bus means for providing addresses for controlling the transfer of operands and instructions between said memory means and said processor means, each one of said addresses comprising

an object field for identifying a corresponding one of said objects,

an offset field for specifying a first number of information bits of offset relative to the start of said corresponding one of said objects, and

a length field for specifying a second number of information bits of said corresponding one of said objects following said first number of information bits to be transferred between said memory means and said processor means, and

microcode control means for storing sequences of microinstructions for controlling said processor means and responsive to instructions for providing said sequences of microinstructions to said processor means,

said ALU means including

general register file means connected from said bus means for storing selected operands and selected addresses,

said general register file means comprising a plurality of vertically ordered registers vertically divided into three parallel-operating and addressed parts,

a first part of said general register file means comprising

first register file means for storing object fields of said addresses,

a second part of said general register file means comprising second register file means for storing offset fields of said addresses, and

a third part of said general register file means comprising third register file means for storing length fields of said addresses, and

address ALU means connected to said general register file means and to said bus means and responsive to first sequences of microinstructions for performing operations on said selected addresses,

said microcode control means responsive to said instructions for providing corresponding further sequences of microinstructions to said ALU means for controlling the operations of said ALU means directed by said instructions, at least one sequence of microinstructions of said first sequences of microinstructions corresponding to each of said instructions, and said ALU means including

ALU microinstruction stack means containing at least one microinstruction stack frame for storing the state of execution of a microinstruction of said first sequences of microinstructions when the execution of said microinstruction has been interrupted.

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**4,480,307**

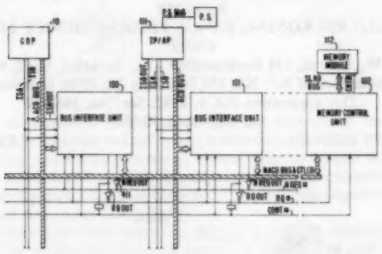
## INTERFACE FOR USE BETWEEN A MEMORY AND COMPONENTS OF A MODULE SWITCHING APPARATUS

**David L. Budde, Portland; David G. Carson, Hillsboro; David B. Johnson, Portland, and Doran K. Wilde, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jan. 4, 1982, Ser. No. 336,866**

**Int. Cl.³ G06F *13/00***

**U.S. Cl. 364—200** **8 Claims**



1. For use with a memory bus including a data portion, said bus providing the means of communication between a memory control unit connectable to a memory module capable of being accessed by said memory control unit, and at least one bus interface unit connectable to a data processor, said data processor being capable of issuing memory requests including address information for a data transfer operation requested of said memory and capable of receiving memory replies including data requested from said memory, each of said memory replies being responsive to a particular memory request, wherein accesses to said memory are handled by means of a series of messages transmitted to said memory control unit in accordance with a specific control protocol, said data processor being further capable of issuing control information for bus transactions, the combination comprising:

message generator means for generating messages in the form of packets of information for transmission on said memory bus, said messages being divided into message types including control message types of packets, request message types of packets corresponding to said memory requests, and reply message types of packets corresponding to said memory replies, each packet comprising one or more bus transmission slots issued by said message generator means sequentially and contiguously, each bus transmission slot in a packet being capable of including an opcode, address, data, control, and parity-check bits;

a pipeline queue;

message controller means connected to said message generator means and to said pipeline queue for controlling said request message packets and said reply message packets such that a predetermined number of said request message packets may be entered into said pipeline queue at any one time;

monitor means connected to said message controller means and to said memory bus for monitoring said request message packets and said reply message packets generated on said bus by said message generator, such that request message packets in excess of said predetermined number are prevented from being generated until a reply message packet is received to thereby free-up a slot in the pipeline;

control signal lines operative in parallel with the data portion of said bus for providing a coded signal representing a particular message type generated on said bus by said message generator; and,

interface logic means connected to said message generator means and to said control signal lines, responsive to said message generator, for driving said control lines to indicate the message type;

said message generator means including means for inserting a particular reply message packet corresponding to a particular request message packet in said pipeline queue at a position in said pipeline queue corresponding to the request message packet that is associated with said particular reply message packet.

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**4,480,308**

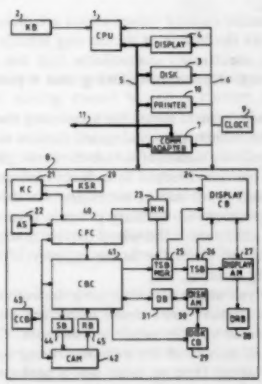
## TEXT PROCESSING SYSTEM WITH COMMUNICATION DATA SAVE FACILITY

**Robert J. Grafe, and Gary E. Leikam, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 9, 1982, Ser. No. 440,400**

**Int. Cl.³ G06F *1/00***

**U.S. Cl. 364—200** **8 Claims**



1. A text processor system including a main memory, communications means for transmitting messages through a communications line and a storage unit for transferring data between storage elements mountable therein and the main memory, said data including a communications control program contained on a communications control storage element and message data contained on a further storage element, and including means for developing, in the main memory, data defining a queue of messages to be communicated from the system under the control of the communications control pro-

gram and means responsive to interruption of the queue data development to cause transfer of the queue data from the main memory to the communications control storage element.

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**4,480,309**

## DRIVE CONTROL DEVICE FOR A MOTOR VEHICLE WHICH IS ALSO EQUIPPED WITH AN ANTI-BLOCKING SYSTEM

**Manfred Burckhardt, Waiblingen; Jürgen Paul, Stuttgart, and Franz Brugger, Winnenden, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Oct. 14, 1982, Ser. No. 434,396**

**Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140959**

**Int. Cl.³ B60T** *13/68*

**U.S. Cl. 364—426** **15 Claims**

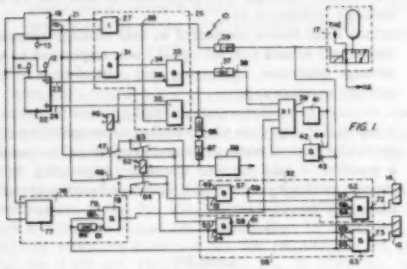

FIG. 1

1. A drive control for a motor vehicle equipped with an anti-blocking system and wheel rotational speed sensors for determining the state of movement of the driving and non-driving wheels, the drive control providing for control cycles in the course of which a driving wheel which is tending to spin is slowed down by actuating its associated wheel brake and comprising

brake pressure control valves which are individually associated with the brakes of the driving wheels of the vehicle and are electrically controllable into one of a pressure-increasing, a pressure-reducing and a pressure-retaining phase,

an electronic control means for processing the output signals from the wheel rotational speed sensors to produce control signals by means of which the brake pressure control valves can be directed into functional positions in the order and combination necessary for drive control, in which positions an auxiliary pressure source is connected to brake calipers of the wheel currently requiring braking and shut off from the brake calipers of the wheel not requiring braking,

a first analysis means for processing the output signal from a single rotational speed sensor associated with a drive shaft of the motor vehicle, which is a measure of the sum of the rotational speeds of the vehicle driving wheels, and the output signal from at least one wheel rotational speed sensor, which is a measure of the rotational speed of the non-driving vehicle wheels, for producing an output signal characteristic of the spin tendency of a driving wheel,

a second analysis means for processing the output signal from at least one of the wheel rotational speed sensors associated with the non-driving vehicle wheels for producing signals characteristic of the state of movement of the vehicle,

and a switch means controlled by switch control signals from a connecting circuit means, the input signals of being the output signals of the first and second analysis means, for providing the following functions within a control cycle:

a. at the beginning of a control cycle, initiated by the output signal of the first analysis means indicating that at least one driving wheel is tending to spin, the switch means takes a first position in which only the brake pressure control valve associated with the driving wheels on one side of the vehicle is operable;

b. if the output signal from the first analysis means and an acceleration signal from the second analysis means are present simultaneously, indicating that, as a result of activating the brake of the driving wheel of that one side of the vehicle, an acceleration of the vehicle is obtained, the switch means maintains the said switching position in which only the valve associated with the driving wheel on that one side of the vehicle is operable;

c. if the output signal from the first analysis means and the output signal from the second analysis means which is characteristic of the steady state of motion condition of the vehicle are present simultaneously, indicating that the state of motion of the vehicle is not affected by the previous activation of the firstly operable brake, then, with a time delay relative to the steady state condition signal, the switch means takes a second switching position for operating the brake pressure control valve on the opposite side of the vehicle;

d. if the output signal of the first analysis means and a deceleration signal of the second analysis means are present simultaneously, indicating that activation of the firstly operable brake does not result in the desired acceleration of the vehicle but in a deceleration thereof, the occurrence of the latter moves the switch means into its second position for operating the brake pressure control valve on the opposite side of the vehicle.

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**4,480,310**

## DEAD RECKONING RANGE FINDING DEVICE FOR CART

**Luis W. Alvarez, 131 Southampton Ave., Berkeley, Calif. 94707**

**Continuation of Ser. No. 154,745, May 30, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,939**

**Int. Cl.³ G06F** *15/50*

**U.S. Cl. 364—450** **6 Claims**

1. In a golf cart having at least three wheels for movement and having a steering linkage coupled to at least one of said wheels to steer said cart along a randomly circuitous path between a first point and a second point, an apparatus for indicating the range from said cart on said randomly circuitous path to said second point when distance and direction from said first point to said second point are known, comprising:

means coupled to at least one of said wheels for measuring, and for providing an output indicative of, distance traveled by said cart between said first point and said second point along said randomly circuitous path;

means coupled to said steering linkage for providing an output indicative of change of cart direction per unit of path length traveled by said cart with respect to the cart's bearing to said second point as it is steered along said randomly circuitous path;

a processor having a first input connected to the output of said distance measuring means, having a second input connected to the output of said change of direction indicating means, and including a first register for storing the distance from said first point to said second point when said cart is at said first point, and including a second register for storing the direction from the first point to the second point when the cart is at said first point, said processor providing an output indicative of the range from said cart on said randomly circuitous path to said second point; and

means having an input connected to the output of said processor for displaying the range from said cart on said randomly circuitous path to said second point.

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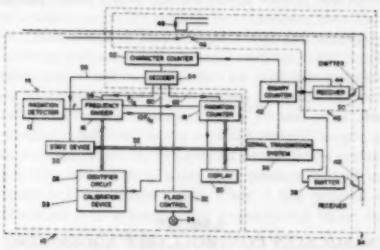
**4,480,311**

## DIGITAL RADIATION DOSEMETER HAVING AN OPTOELECTRONIC TRANSMITTER

**Pierre Mastain, Salons de Provence, and Alain Pailhès, Lamanon, both of France, assignors to Gerin Merlin, Grenoble, France**

**Filed Jun. 22, 1981, Ser. No. 275,938**
**Claims priority, application France, Jul. 1, 1980, 80 14703**
**Int. Cl.³ G01T *1//16***
**U.S. Cl. 364—527** **3 Claims**



1. A radiation detecting system for monitoring ambient ionizing radiation and including a dosemeter retained within a housing and a data processing system external to said housing and constructed to receive said dosemeter for initiating and receiving data from said dosemeter, wherein the improvement in said dosemeter comprises:

radiation detector means for detecting ionizing radiation and for producing electrical signals in response to said radiation;

electronic survey means including a dose radiation counter responsive to said electrical signals for counting and storing a count representing the instantaneous value of the detected dose of radiation;

an identifier circuit means for providing an identifying number for the dosemeter;

main data bus means coupled to said identifier circuit means and said electronic survey means for transmitting said stored count and said identifying number;

serial data transmission means coupled to receive said stored count and said identifying number for providing serial binary data representing said stored count and said identifying number;

first opto-electronic transmitter means coupled to receive said serial binary data and responsive to a control signal for transmitting said serial binary data;

first photosensitive receiver means responsive to said control signal for receiving a read command from said data processing system;

binary control means responsive to said first photosensitive receiver means and coupled to said serial data transmission means to initiate said providing of said serial binary data;

electrical switch means coupled to said first photosensitive receiver means and said first opto-electronic transmitter means for producing said control signal when actuated, and wherein the improvement in said data processing system comprises;

means for receiving said dosemeter at a predetermined position with respect to said data processing system;

second opto-electronic transmitter means positioned to transmit a read command to said first photosensitive receiver means when said dosemeter is in said predetermined position;

second photosensitive receiver means positioned to receive transmitted serial binary data from said first opto-electronic transmitter means when said dosemeter is positioned in said predetermined position for reading said stored count and said identified number; and

means responsive to said dosemeter being in said predetermined position for actuating said electrical switch means to enable initiation of a read command from said second opto-electronic transmitter means and to cause transmission of said serial binary data to said second photosensitive receiver means for reading of said stored count and said identifying number by said data processing system.

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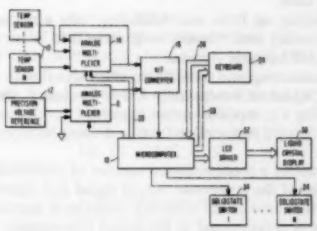
**4,480,312**

## TEMPERATURE SENSOR/CONTROLLER SYSTEM

**Steven L. Wingate, 420 E. 57th St. #80, Loveland, Colo. 80537**

**Filed Aug. 14, 1981, Ser. No. 293,019**
**Int. Cl.³ G06F *15/20*; G01K *7/00***
**U.S. Cl. 364—557** **7 Claims**



1. A temperature sensor/controller comprising:

temperature sensing means having a current output, said temperature sensing means being positioned at a point at which it is desired to measure temperature;

analog multiplexing means coupled to said temperature sensing means and to a voltage-to-frequency converter means for providing a voltage that is proportional to the current output of said temperature sensing means;

precision voltage reference means for providing as an output a substantially temperature insensitive source of reference voltage;

said voltage-to-frequency converter means being further coupled to said precision voltage reference means for alternately providing a first output signal whose frequency is proportional to the current output of said temperature sensing means and a second output signal whose frequency is proportional to the output of said precision voltage reference means; and

processor means coupled to said voltage-to-frequency converter means for alternately applying the output of said analog multiplexing means and the output of said precision voltage reference means to said voltage-to-frequency converter means and for computing the temperature sensed by said temperature sensing means in accordance with a predetermined mathematical relationship involving parameters derived from the output of said temperature sensing means and the output of said precision voltage reference means.

**4,480,313**

## METHOD OF DETERMINING SOUND PROPAGATION

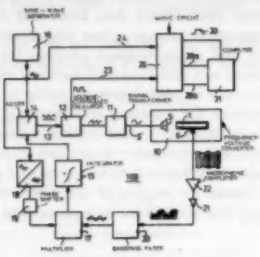
**Eric Benoit, Bern, Switzerland, assignor to Polytronic AG, Muri, Switzerland**

**Filed Dec. 28, 1981, Ser. No. 334,469**

**Claims priority, application Switzerland, Dec. 30, 1980, 9629/80**

**Int. Cl.³ G01P 5/00**

**U.S. Cl. 364—565** **4 Claims**



1. A method of determining the sound propagation velocity in a medium comprising the steps of:

(a) forming a column of said medium in a measuring tube;

(b) activating said column with acoustic energy of a controllable activation frequency in resonance with said measuring tube;

(c) picking up from said measuring tube a resonant output frequency and transforming same into a corresponding output frequency signal;

(d) modulating said output frequency signal with a modulating signal of substantially lower frequency, thereby providing a composite output signal;

(e) forming a mean value from said composite output signal; and

(f) counting a predetermined number of periods of the mean value of the composite output signal and determining the elapsed time of the resulting count such that said elapsed time is proportional to the sound propagation velocity in said medium, said propagation velocity being determined automatically in accordance with the relationship

$$s = N(\lambda/t)(m/s) \qquad (11)$$

wherein N is the number of counted periods, λ is the wavelength and t the time between the first and last counted periods.

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**4,480,314**

## METHOD FOR OPTIMIZING PRINTER RESPONSE TIME FOR A KEY TO PRINT OPERATION

**Charles R. McKelley, Jr., Round Rock; Leslie A. Minshall, and Peter J. Pirich, Jr., both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 17, 1982, Ser. No. 379,274**

**Int. Cl.³ G06F 3/12**

**U.S. Cl. 364—900** **10 Claims**

1. A method for optimizing printer response time in a typing environment in a word processing system, including a keyboard, processor, display, memory and printer, in which the keyboard commands directly control the printer, comprising the steps of:

storing a logical data length representing a number of logical commands for the printer in a printer access method data area of said memory;

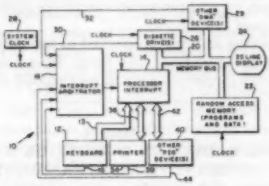
receiving a plurality of blocks of data entered via said keyboard, each of said data blocks including a variable number of logical commands;

creating a buffer header for each of said data blocks received from the keyboard;

transferring each buffer header and its associated data block to a buffer pool in said memory;

reblocking the data blocks in said buffer pool for the number of logical commands for said printer;

transferring said reblocked data blocks to a printer access method buffer in said memory;



evaluating whether said printer access method buffer contains the number of logical commands; and

if said printer access method buffer contains the number of logical commands, transferring said reblocked data blocks from said printer access method buffer to the printer.

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**4,480,315**

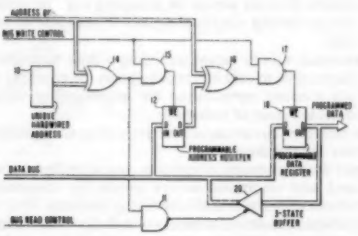
## DYNAMICALLY CONTROLLABLE ADDRESSING IN AUTOMATIC TEST EQUIPMENT

**Robert L. Hickling, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corp., San Jose, Calif.**

**Filed Aug. 16, 1982, Ser. No. 408,404**

**Int. Cl.³ G06F 1/00**

**U.S. Cl. 364—900** **8 Claims**



1. A dynamically controllable addressing circuit coupled to an address bus and a data bus, the circuit comprising:

first register means for storing a fixed address;

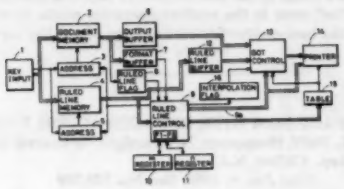
programmable address register means connected to store address information from the data bus when the fixed address in the first register means corresponds to address information on the address bus; and

programmable data register means connected to store data from the data bus when the address information in the programmable address register means corresponds to the address information on the address bus.

## 4,480,316
## RULED LINE PRINT CONTROL SYSTEM IN A WORD PROCESSING APPARATUS

Tomoyuki Yano, Yamatokoriyama, and Hiroki Maruido, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 7, 1982, Ser. No. 415,416
Claims priority, application Japan, Sep. 11, 1981, 56-144377
Int. Cl.³ G06S 3/12
U.S. Cl. 364—900 6 Claims



1. A print control system in a word processing apparatus comprising:

storage means for storing introduced document data and introduced ruled line data;

a printer unit;

read control means for reading out document data and ruled line data stored in said storage means and supplying said read out document data and said read out ruled line data to said printer unit in a print line by print line fashion;

vertical ruled line formation means for printing a vertical ruled line which is perpendicular to said print line, said vertical ruled line having a predetermined length; and

interpolation means for printing an interpolation vertical line between two vertical ruled lines printed by said vertical ruled line formation means when a line spacing of the character lines is longer than a preselected value, thereby printing a continuous vertical ruled line.

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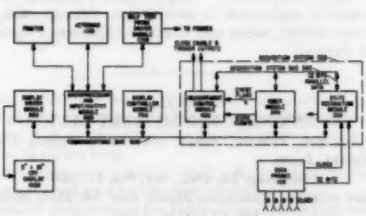
## 4,480,317
## LOGIC STATE ANALYZER WITH GRAPH OF CAPTURED TRACE

George A. Haag, Colorado Springs; O. Douglas Fogg, Loveland; Gordon A. Greenley; Steve A. Shepard, both of Colorado Springs, all of Colo., and F. Duncan Terry, Meridan, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 210,462, Nov. 25, 1980, Pat. No. 4,373,193, which is a continuation of Ser. No. 75,787, Sep. 17, 1979, abandoned, which is a division of Ser. No. 828,138, Aug. 29, 1977,. This application Jan. 7, 1983, Ser. No. 456,218
The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.
Int. Cl.³ G06F 3/05, 3/153
U.S. Cl. 364—900 9 Claims



1. Apparatus for selecting, storing and displaying as a graph of state magnitude versus chronological order a set of states occurring in a collection of digital signals, the apparatus comprising:

control means for designating a trigger state;

input means coupled to receive the collection of digital signals for performing signal conditioning thereon according to preselected thresholds and producing a collection of conditioned signals;

trigger state detection means coupled to the collection of conditioned signals and to the control means for producing a trigger signal upon the occurrence of the designated trigger state in the collection of conditioned signals;

storage means coupled to the collection of conditioned signals and to the trigger signal for storing states occurring in the collection of conditioned signals until a preselected number of such storage operations occur subsequent to the occurrence of the trigger signal; and

graphic output means coupled to the storage means for displaying with cartesian coordinates a graph of the states stored in the storage means, one axis of the cartesian coordinates representing a range of state magnitudes and the other axis representing the chronological order in which the stored states occurred.

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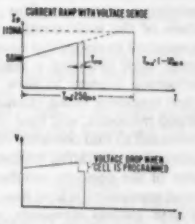
## METHOD OF PROGRAMMING OF JUNCTION-PROGRAMMABLE READ-ONLY MEMORIES

Fu C. Chong, San Jose, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Feb. 18, 1982, Ser. No. 349,790
Int. Cl.³ G11C 11/40
U.S. Cl. 365—104 6 Claims



1. The method of programming a transistor in a PROM, said transistor comprising a collector region of first conductivity type, a base region of second conductivity type and an emitter region of first conductivity type, wherein a first electrical contact is formed to said collector region and a second electrical contact is formed to said emitter region, comprising:

applying a current rising with time across said emitter to collector contacts so as to reverse bias the emitter-base junction and to generate a voltage across said emitter to collector contacts;

detecting the programming time at which the rise in said voltage suddenly stops and said voltage drops and

holding said current for a selected time $T_{PH}$ following said voltage drop;

causing the emitter-base junction to be destroyed and a low resistance path to be created through the remainder of the transistor, without damage to the remainder of the transistor.

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## EMITTER COUPLED FLIP FLOP MEMORY WITH COMPLEMENTARY BIPOLAR LOADS

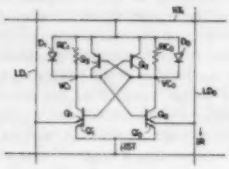
**Atsuo Hotta, Higashiyamato, and Yukio Kato, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

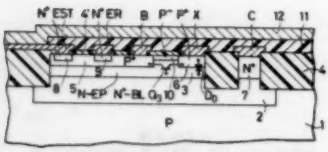
**Continuation of Ser. No. 003,013, Jan. 12, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,475**

**Claims priority, application Japan, Jan. 25, 1978, 53-6212**

**Int. Cl.³ H01L *27/04*; G11C *11/40***

**U.S. Cl. 365—155** **4 Claims**





**1. A memory cell comprising:**

first and second multi-emitter transistors of one conductivity type each having first and second emitters, a base and a collector, said first emitters of the multi-emitter transistors being commonly connected to a first current source allowing a sustaining current to flow therethrough, said second emitters of the multi-emitter transistor being respectively connected to respective ones of a pair of second current sources each allowing a readout current larger than said sustaining current to flow therethrough, said base of the first transistor being connected to said collector of the second transistor, said base of the second transistor being connected to said collector of the first transistor;

a node for receiving an operating potential;

a third transistor of the opposite conductivity type to said first and second transistors, whose base is connected to the collector of said second transistor, whose collector is connected to the collector of said first transistor, and whose emitter is connected to said node;

a fourth transistor of the same conductivity type as said third transistor, whose base is connected to the collector of said first transistor, whose collector is connected to the collector of said second transistor, and whose emitter is connected to said node;

a first resistor connected between the collector and emitter of said third transistor, the resistance value of said first resistor being so selected that a voltage drop, appearing across said first resistor as a result of a base current of said second transistor in the "on" state in a readout operation mode, is larger than the base-emitter forward voltage of said fourth transistor in the case where said third transistor is disconnected from said first resistor;

a second resistor connected between the collector and emitter of said fourth transistor, the resistance value of said second resistor being so selected that a voltage drop, appearing across said second resistor as a result of a base current of said first transistor in the "on" state in a readout operation mode, is larger than the base-emitter forward voltage of said third transistor in the case where said fourth transistor is disconnected from said second resistor; and

wherein the third transistor operates in the "on" state so that a voltage drop, appearing across said first resistor as a result of the base current of said second transistor in the "on" state in the readout operation mode, is smaller than the base-emitter forward voltage of said fourth transistor, while the fourth transistor operates in the "on" state so that the voltage drop, appearing across said second resistor as a result of the base current of said first transistor in the "on" state in the readout operation mode, is smaller than the base-emitter forward voltage of said third transistor.

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**4,480,320**

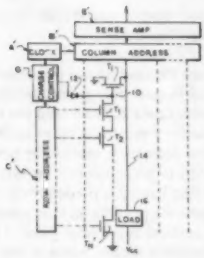
## COMPACT ROM WITH REDUCED ACCESS TIME

**Kenneth L. Naiff, Hauppauge, N.Y., assignor to General Instrument Corp., Clifton, N.J.**

**Filed Jun. 1, 1982, Ser. No. 383,709**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—189** **31 Claims**



**1. A circuit suitable for use in a read only memory comprising a source of a first potential, a control node, an output node normally maintained at a relatively high potential, a plurality of driver transistors, each having a control terminal and an output circuit, said output circuits being operably connected in series between said source and said control node, means for selecting a driver transistor and for applying a select signal to the control terminal thereof and a non-select signal to each of the control terminals of the non-selected driver transistors, respectively, means for isolating said control node from said output node, said isolating means being effective, when actuated, to prevent said output node from discharging from said high potential, and means for charging said control node to a potential higher than the first potential, prior to the application of said select and non-select signals, said isolating means comprising an isolation transistor having an output circuit operatively connected between a reference potential and said output node and a control terminal operatively connected to said control node, said transistor being actuated if said control node is operatively connected to said source, through said series connected drivers, when said select and non-select signals are applied thereto.**

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**4,480,321**

## SEMICONDUCTOR MEMORY DEVICE

**Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 24, 1982, Ser. No. 411,008**

**Claims priority, application Japan, Aug. 24, 1981, 56-132406**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—189** **16 Claims**

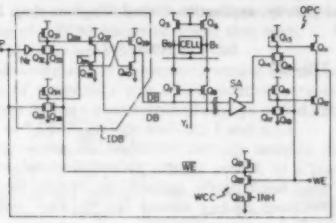
**1. A semiconductor memory device having an input address signal and write in data in which switching from a readout mode to a write in mode and vice versa is effected on the basis**

of a write-enable signal applied thereto, the semiconductor memory device comprising:

a plurality of memory cells;

a data bus operatively connected to said plurality of memory cells;

an input/output circuit, operatively connected to said data bus, having an input circuit portion for receiving input data and supplying it to said data bus, and having an output circuit portion for outputting readout data from the data bus; and



a circuit, operatively connected to said input/output circuit, for detecting when the input address signal changes, said circuit generating a pulse having a predetermined pulse width when the input address signal has changed, wherein the input circuit portion of said input/output circuit operates to inhibit the writing in of the write in data during the generation of the pulse even when the write-enable signal is supplied to the memory device and wherein said input circuit portion operates in accordance with the write-enable signal when the pulse is not generated.

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**4,480,322**

## PASSIVE UNDERWATER RANGE MEASUREMENT ACOUSTIC SYSTEM

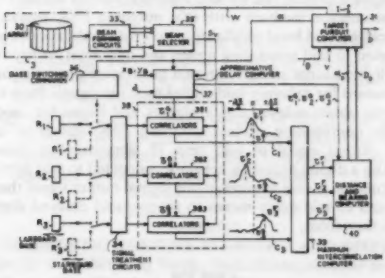
**Francois Orieux, and Jean Berthéas, both of Paris, France, assignors to Thomson CSF, Paris, France**

**Filed Apr. 5, 1982, Ser. No. 365,383**

**Claims priority, application France, Apr. 15, 1981, 81 07547**

**Int. Cl.³ G01S *3/80, 5/18***

**U.S. Cl. 367—123** **9 Claims**



1. An underwater acoustic system for submarines equipped with a passive monitoring system having preformed beams for detecting at least one noise source with bearing angle $\alpha$ and distance D comprising:

at least three aligned receivers $R_1$, $R_2$ and $R_3$ receiving the signals produced by the noise sources,

means for determining the delay $\Delta t_{12}$ of the signal received by the receiver $R_2$ with respect to that of receiver $R_1$, and the delay $\Delta t_{23}$ of the signal received by receiver $R_2$ with respect to that of receiver $R_3$, by measuring the delays $\tau_1$, $\tau_2$ and $\tau_3$ between the beam signal from the passive monitoring system corresponding to the beam whose direction is closest to that of the noise source and the signals from receivers $R_1$, $R_2$ and $R_3$ so that $\Delta t_{12}=\tau_1-\tau_2$ and $\Delta_{23}=\tau_2-\tau_3$,

means for calculating from values $\Delta t_{12}$ and $\Delta t_{23}$ the values of $\alpha$ and of D,

means for tracking one or more noise sources from the values of $\alpha$ and D.

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**4,480,323**

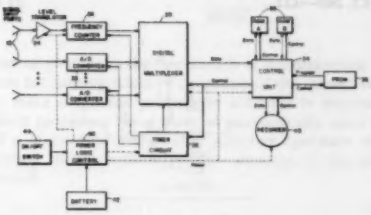
## REMOTE SELF-CONTAINED UNDERSEA MONITOR

**Robert E. Page, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 7, 1982, Ser. No. 386,127**

**Int. Cl.³ H04B *11/00***

**U.S. Cl. 367—131** **17 Claims**



1. An apparatus for remote oceanographic data recording being self-contained and battery operated comprising:

a plurality of means for receiving data signals from oceanographic data sensors;

means connected to the output of the receiving means for conditioning the data signals to be recorded;

means for recording the conditioned data signals;

means connected to the conditioning means and the recording means for controlling their operation and handling the transfer of data signals to the recording means in a predetermined manner;

means connected to the receiving means, the conditioning means, the recording means, and the controlling means for energizing them; and

means disposed to receive a remotely originated signal for activating the energizing means and the control means.

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## CONSTANT BEAMWIDTH FREQUENCY INDEPENDENT ACOUSTIC ANTENNA

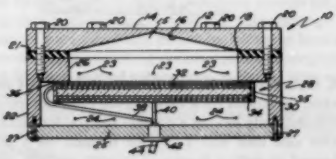
**Robert L. Sternberg, Noank, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 11, 1983, Ser. No. 483,988**

**The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.**

**Int. Cl.³ H04B *13/00***

**U.S. Cl. 367—150** **6 Claims**



1. An acoustic device adapted for use in an underwater system comprising a filter plate of variable thickness having

means for receiving signals, said filter plate having first and second opposing surfaces, said filter plate having said first surface which is substantially planar and said second surface which is substantially right circular conical with the axis of said conical surface perpendicular to said first surface, the thickness of the plate at each point over its surface area being not more than one-twentieth of the wavelength of the acoustic signals to be transmitted at that point.

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**4,480,325**

## OPTICAL PICKUP

**Kunio Aiki, Hachiouji, and Masahiro Ojima, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 169,794, Jul. 17, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,220**

**Claims priority, application Japan, Jul. 20, 1979, 54-99374**

**Int. Cl.³ G11B *7/00***

**U.S. Cl. 369—122** **21 Claims**

1. An information reproducing system comprising a semiconductor laser device arranged to project a laser beam onto an optical disc containing information for reflection therefrom, means to oscillate said semiconductor laser device for driving said semiconductor laser device in a multiple longitudinal mode, optical means provided between said semiconductor laser device and the optical disc for deriving a beam of the reflection of the laser beam from the optical disc, and photoelectric conversion means responsive to the beam derived by said optical means for providing an output signal corresponding to the information contained on the optical disc.

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**4,480,326**

## STYLUS HAVING A CONDUCTIVE CARBON LAYER

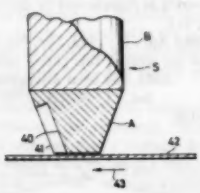
**Hideaki Takehara, Fujisawa, Japan, assignor to Victor Company of Japan, Ltd., Japan**

**Division of Ser. No. 326,391, Dec. 1, 1981, Pat. No. 4,420,675. This application Jul. 15, 1983, Ser. No. 514,342**

**Claims priority, application Japan, May 26, 1981, 56-79889**

**Int. Cl.³ G11B *11/00, 9/06***

**U.S. Cl. 369—173** **2 Claims**



1. A record stylus for use in detecting signals recorded as geometric variations on a capacitance disk, comprising:

a diamond body having a contact surface for making contact with said disk and a groove formed on a side surface thereof extending from said contact surface; and

a conductive layer formed on the bottom surface of said groove, said conductive layer being composed of the carbon constituent of a surface portion of the diamond body formed by a beam of heat-producing energy in oxygen containing environment.

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## SINGLE CHANNEL DUPLEX COMMUNICATION SYSTEM

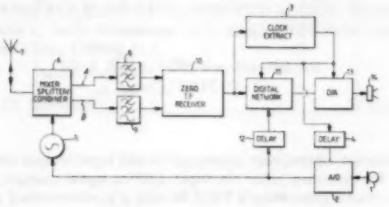
**Ian A. W. Vance, Newport, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Continuation of Ser. No. 292,097, Aug. 12, 1981,. This application Dec. 7, 1983, Ser. No. 559,167**

**Claims priority, application United Kingdom, Aug. 26, 1980, 8027566**

**Int. Cl.³ H04L *5/14***

**U.S. Cl. 370—27** **12 Claims**




1. A transmitter/receiver system fir a digital single channel duplex communication system wherein transmission through a transmission medium is effected by way of frequency shift keyed (FSK) signals, comprising transmit/receive means for transmitting outgoing FSK signals into and receiving incoming FSK signals from the transmission medium; a transmitter portion including a source of digital message signals representative of the message to be transmitted, a local oscillator capable of being modulated by digital signals to produce FSK signals, means for supplying said digital message signals to said local oscillator to modulate the latter with said digital message signals for producing said outgoing FSK signals, means for applying said outgoing FSK signals from said local oscillator to said transmit/receive means for transmission into the transmission medium; and a receiver portion including means for generating quadrature ouput signals by mixing said incoming FSK signals as received by said transmit/receive means from the transmission medium with said outgoing FSK signals as produced by said local oscillator, zero IF demodulation means connected to said generating means and operative for producing a digital output signal from said quadrature output signals, delay means for delaying said digital message signals from said source to obtain delayed digital signals, and means for cancelling the contribution of said outgoing FSK signals to said digital output signal of said zero IF demodulation means, including a digital decoding network connected to said zero IF demodulation means to receive said digital output signal therefrom, and to said delay means to receive said delayed digital signals therefrom.

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## METHOD OF AND SYSTEM FOR COMMUNICATION VIA SATELLITE

**Gian B. Alaria, and Roberto Preti, both of Turin, Italy, assignors to Cselt - Centro Studi E Laboratori Telecomunicazioni S.p.A., Turin, Italy**

**Continuation-in-part of Ser. No. 326,480, Dec. 2, 1981, abandoned. This application Apr. 14, 1982, Ser. No. 368,297**

**Claims priority, application Italy, Dec. 3, 1980, 68840 A/80**

**Int. Cl.³ H04J *15/00***

**U.S. Cl. 370—63** **9 Claims**

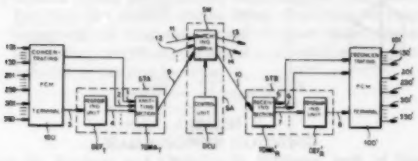
1. A method of exchanging digitized message samples between ground stations via a relay station aboard a communication satellite, in a system wherein such samples are entered in

active time slots of an outgoing PCM frame temporarily allocated to respective sources and are modulated at an accelerated bit rate, as part of an outgoing TDMA frame, upon a radio-frequency carrier beamed toward the satellite from a transmitting section of a ground station, each TDMA frame having a period encompassing a multiplicity of PCM frames and consisting of a plurality of packets individually switchable by the relay station to another carrier beamed toward a receiving section of another ground station as part of an incoming TDMA frame for demodulation and entry of their samples in active time slots of an incoming PCM frame temporarily allocated to respective destinations thereof, each TDMA frame consisting of p PCM frames of n time slots each,

comprising the steps of:

(a) registering at said transmitting section the message samples of a plurality p.m of consecutive outgoing PCM frames during a predetermined storage period encompassing m TDMA periods with $m>1$ and $p>1$;

(b) regrouping the registered message samples, during an immediately following storage period, in a plurality of special packets of identical length equal to a TDMA period, each of said special packets containing all the



message samples of a limited number $q=n/m$ of homologous time slots with destinations reachable through a common remote ground station;

(c) successively assembling said special packets together with other packets of like length in respective outgoing TDMA frames with an accelerated bit rate;

(d) modulating each outgoing TDMA frame, as part of a superframe of m TDMA frames with a duration equaling said storage period, upon a carrier beamed toward the satellite;

(e) switching each of said packets at said relay station to a carrier beamed to a receiving section of a ground station serving the destinations of the message samples contained therein;

(f) registering at said receiving section, for the duration of said storage period, special packets of incoming TDMA frames differing from one another in the destinations of their message samples; and

(g) regrouping the message samples of the special packets registered in step (f), during the next-following storage period, in time slots of incoming PCM frames temporarily allocated to their respective destinations.

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## DIAGNOSTIC ROUTINE SELECTOR AND DISPLAY

**John H. Gordebeke, Aj Venlo, Netherlands, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 30, 1982, Ser. No. 363,708**

**Claims priority, application United Kingdom, Mar. 31, 1981, 8110040**

**Int. Cl.³ G06F *11/00***

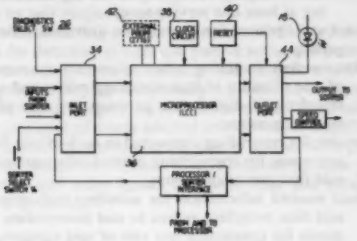
**U.S. Cl. 371—20** **5 Claims**

1. In a reproduction machine for producing impressions of an original, the reproduction machine having a photosensitive member and a plurality of discrete operating components cooperable with one another and the photosensitive member to produce the impressions on copy paper, and including an accessory for operating on the copy sheet, the accessory comprising

a controller storing several diagnostic procedures, the controller including a microprocessor and a memory,

a first switch connected to the microprocessor, the first switch settable into either a normal or diagnostic position,

a second switch connected to the microprocessor, the second switch controlling operation of the accessory, and



means responsive to the first switch in the diagnostic position for causing selective operation of the second switch to make diagnostic procedures available in sequence, a given procedure being initiated automatically upon lapse of a given time period after selective operation of the second switch without further actuation of the second switch.

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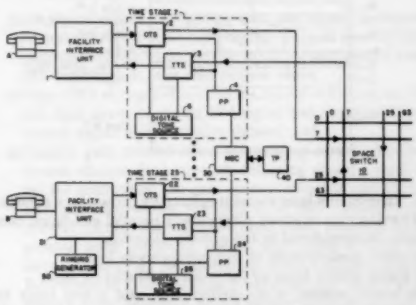
## ARRANGEMENT FOR DIGITAL TONE DISTRIBUTION

**Stig E. Magnusson, Phoenix; Sergio E. Puccini, Scottsdale, and Kamal I. Parikh, Phoenix, all of Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.**

**Filed Nov. 22, 1982, Ser. No. 443,263**

**Int. Cl.³ H04Q *11/04*; H04J *15/00***

**U.S. Cl. 370—110.2** **7 Claims**



1. In a digital switching network of a Multiprocessor Switching System, an arrangement for digital tone distribution comprising:

a plurality of switching system subscribers including at least first and second subscribers, each said subscriber connected to said multiprocessor switching system for transferring data between any two of said subscribers;

a plurality of time switching means including at least a first and second time switching means connected respectively to said first and second subscribers, each said time switching means including:

originating time switching means connected to at least one said subscriber for switching digital data from said subscriber;

terminating time switching means connected to at least one said subscriber for switching digital data to said subscriber;

first processor means connected to said originating and terminating time switching means and said first processor operated to control said digital data switching via said connected originating and terminating time switching means;

tone generation means connected to said originating and terminating time switching means and said tone generation means operated to produce digital data representing at least one service tone;

said arrangement for digital tone distribution further comprising:

intermediate switching means selectively connected to each of said plurality of time switching means and operated to transfer said digital data between any two of said time switching means;

means for controlling connected to each of said first processor means for transmitting control information to each of said first processor means;

said control information for selecting said connections of said time switching means to said intermediate switching means for connecting any two of said subscribers; and

said first processor means of said second time switching means operated to connect said tone generation means of said second time switching means to said first subscriber through said intermediate switching means.

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**4,480,331**

## INJECTION LASER WITH AN INVERTED WAVEGUIDING RIB

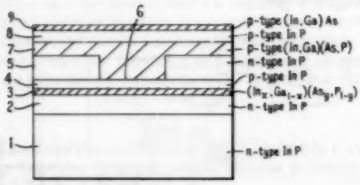
**George H. B. Thompson, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed May 27, 1982, Ser. No. 382,507**

**Claims priority, application United Kingdom, Jul. 2, 1981, 8120465**

**Int. Cl.³ H01S *3/19***

**U.S. Cl. 372—45** **11 Claims**




1. An injection laser element epitaxially grown on a substrate and having two opposite substantially parallel end faces, comprising, as considered in the growth direction:

a lower passive layer of one conductivity type,

a planar active layer of the other conductivity type,

an upper passive layer sandwiching said active layer between itself and said lower passive layer, and being of a material with a lower refractive index and higher band gap than, and of the same conductivity type as, the material of said active layer,

a blocking layer covering said upper passive layer except for a region of a stripe extending from one to the other of the opposite end faces substantially normal thereto, and

an intermediate index layer of a material with a refractive index intermediate those of the materials of said active and upper passive layers and of a conductivity type identical to that of the material of said upper passive layer and opposite to that of the material of said blocking layer, said intermediate index layer covering said blocking layer and extending into said stripe region into contiguous relationship with the material of said upper passive layer,

the refractive indexes of the materials of said intermediate index, blocking, upper passive, and active layers being such in relation to one another and to the thicknesses of the respective layers that said intermediate layer is so optically coupled at the laser emission wavelength with said active layer as to provide a guided wavelength in the direction of propagation that is shorter in the region of said active layer that is overlaid by said stripe than in the adjacent regions of said active layer.

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**4,480,332**

## APPARATUS FOR EXAMINATION BY SCATTERED RADIATION

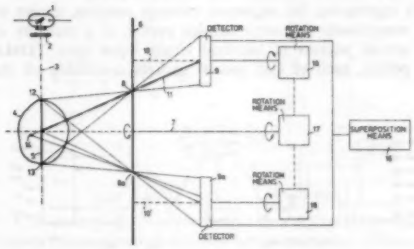
**Helmut Strecker, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed May 3, 1982, Ser. No. 374,124**

**Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120567**

**Int. Cl.³ G01M *23/20***

**U.S. Cl. 378—87** **6 Claims**




1. An apparatus for producing an image of a layer of a body to be examined, said apparatus comprising:

means for irradiating the body with a flat, fan-shaped beam of radiation to produce scattered radiation by scattering from the body;

a diaphragm plate having a major surface extending parallel to and outside of the fan-shaped beam, said plate arranged to be rotatable about an axis perpendicular to the major surface, said diaphragm having an aperture therethrough located off of the axis;

a detector arranged behind the aperture in the diaphragm plate and arranged to rotate with the diaphragm about the diaphragm axis for measuring scattered radiation which passes through the aperture, said detector also being arranged to be rotatable, with the same rotational velocity as the diaphragm plate but with a direction of rotation opposite to that of the diaphragm plate, about a detector axis which is perpendicular to the major surface of the diaphragm plate and which passes through the center of the detector;

means for rotating the diaphragm plate; and

means for rotating the detector.

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**4,480,333**

## METHOD AND APPARATUS FOR ACTIVE SOUND CONTROL

**Colin F. Ross, Cambridge, England, assignor to National Research Development Corporation, London, England**

**Filed Apr. 13, 1982, Ser. No. 368,095**

**Claims priority, application United Kingdom, Apr. 15, 1981, 8111906**

**Int. Cl.³ H04B *15/00***

**U.S. Cl. 381—71** **10 Claims**

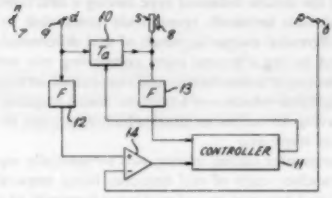
1. A sound control system comprising:

first receiver means for generating first output signals representative of sound received at, or near, a first location where sound from a second location is to be cancelled,

second receiver means for receiving signals at a third loca-

tion and generating second output signals related to sounds at the second location,

operational means including a computing section for operating on the second output signals according to a transfer function and generating input signals, and a transmission section for receiving said input signals and generating sounds at a fourth location, which when received at the




first location, tend to cancel sound received from the second location at the first location, and

a control means automatically adjusting the said transfer function, the control means being responsive to output signals of the first and second receiver means thereby optimizing cancellation of sound received from the second location at the first location.

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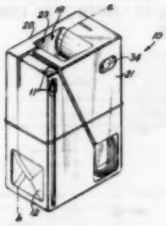
**4,480,334**

## RADIOSONDE HOUSING

**John M. Beukers, and Christian B. Williams, both of Stony Brook, N.Y., assignors to Beukers Laboratories, Inc., St. James, N.Y.**

**Filed Jun. 16, 1982, Ser. No. 389,051**
**Int. Cl.³ H04B 1/034**
**U.S. Cl. 455—98** **14 Claims**



7. A radiosonde housing comprising top and bottom parts which enclose sensing and radio transmitting components therein when combined, said combined top and bottom parts integrally forming within said housing a venturi-shaped air flow duct, and a humidity sensor suspended within said venturi-shaped air flow duct, said radiosonde housing being used as both a shipping container and a flight package.

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**4,480,335**

## NOISE REMOVING APPARATUS IN AN FM RECEIVER

**Hiroyasu Kishi, Gunma, Japan, assignor to Sanyo Electric Company Ltd., Moriguchi and Tokyo Sanyo Electric Co., Gunma, both of, Japan**

**Filed May 4, 1982, Ser. No. 374,887**
**Claims priority, application Japan, May 28, 1981, 56-81651**
**Int. Cl.³ H04B 1/10**
**U.S. Cl. 455—212** **10 Claims**

1. A noise reducing apparatus in an FM receiver comprising:

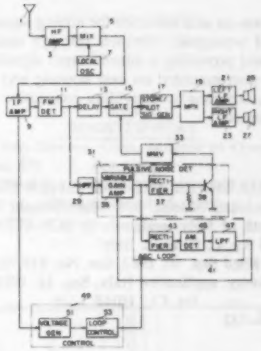
means for receiving a frequency modulated signal and generating an intermediate frequency signal therefrom;

means coupled to said FM receiving means for FM detecting said intermediate signal and generating an output signal therefrom, said output signal including noise signals comprising pulsive noise and continuous noise resulting from multipath noise;

output means for receiving said output signal;

gate means coupled between said detecting means and said output means for interrupting the receipt of said output signal by said output means;

pulsive noise detecting means coupled to said FM detecting means for detecting at least said pulsive noise, said pulsive noise detecting means comprising variable gain amplifier means for amplifying substantially only said noise signals and providing a signal representative thereof, and automatic gain control means adapted to receive said amplified noise signals for controlling the gain of said variable gain amplifier means in response to said continuous noise included in said noise signals so that at least said pulsive noise is detected;



gate control means for opening said gate means in response to said amplified noise representative signal thereby interrupting receipt of said pulsive noise by said output means and removing at least said pulsive noise;

electric field strength detecting means for detecting an electric field strength of said FM signal and for providing an output signal representative thereof; and

automatic gain control effect controlling means responsive to said electric field strength detecting means output signal for controlling the gain control effect of said variable gain amplifier means resulting from said automatic gain control means, said multipath noise being detected by said pulsive noise detecting means when said electric field strength detecting means detects an electric field having a field strength greater than a predetermined value and said pulsive noise detecting means further provides an output signal for enabling said gate means to interupt the receipt of said multipath noise by said output means.

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**4,480,336**

## ORTHOGONAL HYBRID FIN-LINE MIXER

**Joseph S. Wong, Upland; Kuo-Ing Chung, Covina, and Kenneth A. Rudenauer, Pomona, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.**

**Filed Sep. 20, 1982, Ser. No. 420,444**
**Int. Cl.³ H04B 1/26**
**U.S. Cl. 455—328** **10 Claims**

1. An orthogonal hybrid fin-line mixer, comprising:

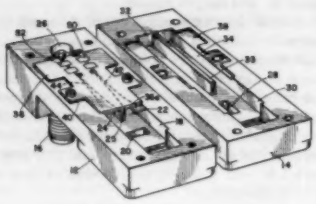
an elongate housing including two separable half-members, separable substantially along a longitudinal center plane of said housing;

an inlet waveguide formed in each of said half-members for connecting to a respective signal source;

a plurality of waveguide channels in said housing which,

together with said inlet waveguides, form an orthogonal hybrid-T waveguide structure;

a planar fin-line substrate mounted in said housing to be substantially co-planar with said center plane and to lie within the respective E-planes of said waveguide channels;



circuit means on said substrate for mixing signals introduced into said waveguide channels through said input waveguides and providing a mixed output signal;

an output port mounted on said housing and connected to said circuit means for providing connection to said mixed output signal.

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**4,480,337**

**TRANSISTOR MIXER AND AMPLIFIER INPUT STAGE**

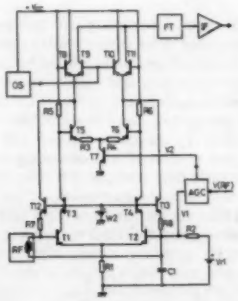
**Rinaldo Graziadei, Monza, and Michelangelo Lorusso, Carbonara, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Brianza, Italy**

**Filed Sep. 10, 1982, Ser. No. 416,708**

**Claims priority, application Italy, Sep. 16, 1981, 23984 A/81**

**Int. Cl.³ H04B *1/26***

**U.S. Cl. 455—333** **3 Claims**



1. A transistor mixer and amplifier stage for a radio frequency receiver comprising:

a voltage supply having two terminals;

a differential amplifier connected between said voltage supply terminals having two differential input terminals, two differential output terminals and a gain control terminal;

a radio frequency signal generator having two output terminals, said differential input terminals of said differential amplifier being respectively connected to said two output terminals of said radio frequency signal generator;

a receiver control circuit having at least one output terminal, said gain control terminal of said differential amplifier being connected to said at least one output of said receiver control circuit which generates on at least one output terminal a voltage which is variable as a function of the average level of a radio frequency input signal so as to automatically control the gain of said differential amplifier;

an oscillator having two output terminals and a mixer circuit of the double balanced type having a first input comprising two terminals respectively connected to said two differential output terminals of said differential amplifier, and having a second input comprising two terminals respectively connected to said two output terminals of said oscillator which is of a predetermined frequency and also having an output terminal which comprises an output of said stage; and

an attenuator circuit having two substantially equal circuit branches, each of said branches being respectively connected between one of said input terminals of said differential amplifier and said first input of said mixer circuit, and having an enabling terminal connected to one of said at least one output terminal of said control circuit, said attenuator circuit being responsive to a voltage at one of said at least one output terminal of said control circuit so as to be gradually activated to attenuate signals flowing therethrough when an average level of said radio frequency input signal exceeds a preselected level.

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**4,480,338**

**LOWPASS-HIGHPASS ELECTRONIC SWITCH**

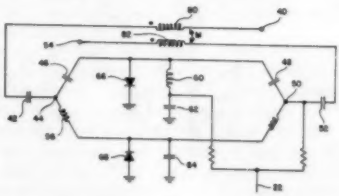
**Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Continuation of Ser. No. 353,694, Mar. 1, 1982, Pat. No. 4,435,841. This application Sep. 1, 1983, Ser. No. 528,692**

**The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.**

**Int. Cl.³ H04B *1/16*; H03H *7/00***

**U.S. Cl. 455—188** **3 Claims**



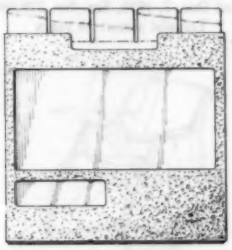
1. A switchable filter for use in a multichannel communications receiver for passing either a first or a second band of channels in response to an input control signal comprising an arrangement of inductors and capacitors, a first switching means and a second switching means, said first and second switching means being responsive to said input control signal for causing said inductors and capacitors to assume a first filter characteristic for passing said first band of channels or to assume a second filter characteristic for passing said second band of channels, at least one of said switching means being characterized by a parasitic reactance coupled across said filter, said filter comprising compensating means coupled thereacross for reducing the effect of said parasitic reactance.

# DESIGNS

OCTOBER 30, 1984

276,094
SANDAL
Morris Cohen, 1734 S. Fairfax, Los Angeles, Calif. 90019
Filed Apr. 22, 1982, Ser. No. 370,938
Term of patent 14 years
U.S. Cl. D2—270

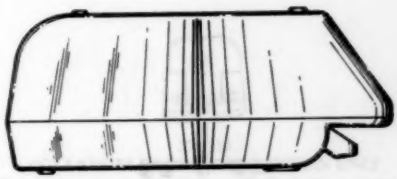
276,095
FILING SYSTEM FOR FLOPPY DISCS
Toshihiko Sakow, Teaneck, N.J., assignor to Toshihiko Sakow Associates, Inc., Teaneck, N.J.
Filed Feb. 5, 1982, Ser. No. 346,253
Term of patent 14 years
U.S. Cl. D3—35



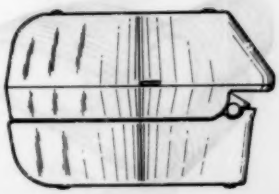
276,096
KEY-HOLDER
Attilio Brentini, c/o Lansa S.A., Chemin du Croset 9, Ecublens, Switzerland
Filed Oct. 12, 1982, Ser. No. 433,646
Claims priority, application Switzerland, Apr. 13, 1982, 72279
Term of patent 14 years
U.S. Cl. D3—61

276,097
TOOTHPASTE DISPENSER
Earl N. Ditgen, Rte. #1, Nickerson, Kans. 67561
Filed Sep. 14, 1981, Ser. No. 302,099
Term of patent 14 years
U.S. Cl. D4—108

276,098
BOOSTER SEAT
Richard E. Cone, Dayton, Ohio, assignor to Questor Corporation, Tampa, Fla.
Filed Sep. 20, 1982, Ser. No. 420,377
Term of patent 14 years
U.S. Cl. D6—333



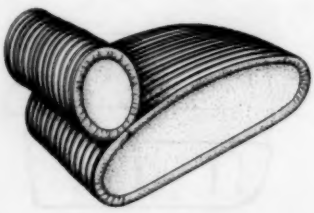
276,099
BOOSTER SEAT
Richard E. Cone, Dayton, Ohio, assignor to Questor Corporation, Tampa, Fla.
Filed Sep. 20, 1982, Ser. No. 420,394
Term of patent 14 years
U.S. Cl. D6—333



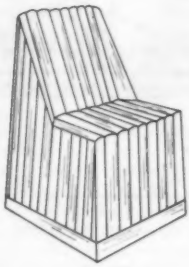
276,100
COMBINED TABLE AND MAGAZINE RACK
James B. Middleton, 1155 McConnell Dr., Decatur, Ga. 30033
Filed Jun. 24, 1982, Ser. No. 391,562
Term of patent 14 years
U.S. Cl. D6—466

276,101
CHAIR
Wolfgang Müller-Deisig, Borgenteich, Fed. Rep. of Germany, assignor to Fehlbaum & Co., Dornach, Switzerland
Division of Ser. No. 212,467, Dec. 3, 1980,. This application Aug. 4, 1982, Ser. No. 405,116
Term of patent 14 years
U.S. Cl. D6—366

276,102
CHAIR
George C. Mulhauser, Paramus, N.J., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 12, 1981, Ser. No. 242,876
Term of patent 14 years
U.S. Cl. D6—361

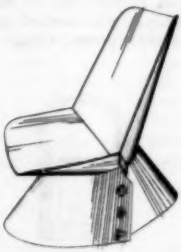


276,103
CHAIR COVER
William F. Turner, 1 Grove Ct., New York, N.Y. 10014, and Kenneth L. Wyse, New York, N.Y., assignors to William F. Turner, New York, N.Y.
Continuation-in-part of Ser. No. 13,601, Feb. 21, 1979,. This application Oct. 6, 1981, Ser. No. 308,997
Term of patent 14 years
U.S. Cl. D6—502



276,104
SLED BASED ARM CHAIR
Robert A. Keeler, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Dec. 7, 1981, Ser. No. 328,462
Term of patent 14 years
U.S. Cl. D6—372

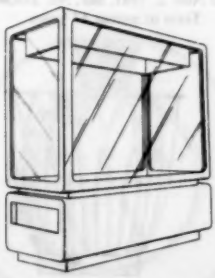
276,105
FOLDABLE CHAIR
Reinout I. M. M. Meltzer, 245 C, Honingerdijk, Postal code 3063 NA, Rotterdam, Netherlands
Filed Mar. 26, 1982, Ser. No. 362,162
Term of patent 14 years
U.S. Cl. D6—364



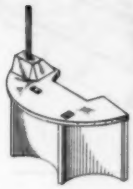
276,106
FOLDING CHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Feb. 9, 1982, Ser. No. 347,443
Claims priority, application France, Aug. 11, 1981, 812.799
Term of patent 14 years
U.S. Cl. D6—368

276,107
FOLDING CHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Feb. 9, 1982, Ser. No. 347,442
Claims priority, application France, Aug. 11, 1981, 812.799
Term of patent 14 years
U.S. Cl. D6—368

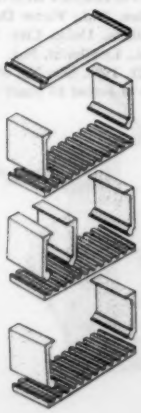
276,108
DISPLAY CASE
James B. Bowers, Tulsa, Okla., assignor to H and H Promotions, Inc., Tulsa, Okla.
Filed Dec. 31, 1981, Ser. No. 336,077
Term of patent 14 years
U.S. Cl. D6—470



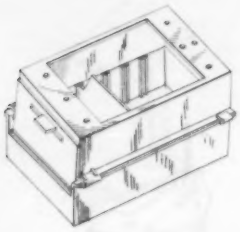
276,109
EXAMINATION TABLE AND CHAIR COMBINATION OR SIMILAR ARTICLE
Michael D. Gordon, and Hollis D. Baker, both of Derby, Kans., assignors to Rota Development Company, Derby, Kans.
Filed Oct. 15, 1981, Ser. No. 311,548
Term of patent 14 years
U.S. Cl. D6—338



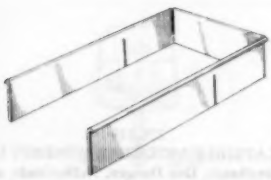
276,110
COLLAPSIBLE MODULAR WINEBIN UNIT
Wilhelmus Savelkouls, Den Dungen, Netherlands, assignor to 3 S Beton B.V., Grave, Netherlands
Filed Sep. 29, 1981, Ser. No. 306,849
Claims priority, application Benelux, Apr. 2, 1981, 55613 00
Term of patent 14 years
U.S. Cl. D6—467



276,111
FILE DRAWER
John S. Doyel, 404 W. 20th St., New York, N.Y. 10016
Filed May 3, 1982, Ser. No. 374,192
Term of patent 14 years
U.S. Cl. D6—510

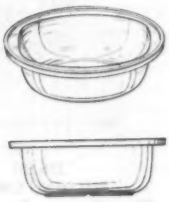


276,112
HOSPITAL BED PROTECTIVE DEVICE
Linda S. Ferrell, 5303 Ebell St., Long Beach, Calif. 90808, and Janet S. Roberts, 15921 Wicklow La., Huntington Beach, Calif. 92647
Filed Jun. 10, 1982, Ser. No. 387,030
Term of patent 14 years
U.S. Cl. D6—503

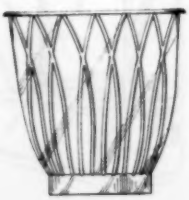


276,113
WEIGHT FOR VENETIAN BLIND CORDS
Joseph A. Anderle, Clifton, N.J.; Victor Debs, Staten Island, N.Y., and Manuel Toledo, Union City, N.J., assignors to Levolor Lorentzen, Inc., Lyndhurst, N.J.
Filed May 21, 1982, Ser. No. 380,954
Term of patent 14 years
U.S. Cl. D6—581

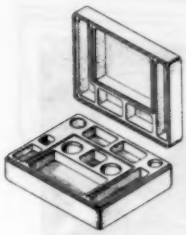
276,114
CASSEROLE DISH OR THE LIKE
Rino Conti, Stoughton, Mass.; Robert H. C. M. Daenen, Hekelgem, Belgium; Gerald M. Grusin, Chicago, Ill.; Augusto A. Picozza, Johnston, R.I., and James B. Swett, Altamonte Springs, Fla., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 7, 1982, Ser. No. 385,974
Term of patent 14 years
U.S. Cl. D7—1



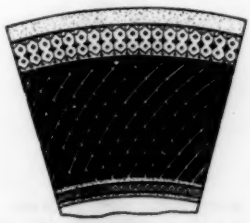
276,115
TUMBLER
Robert L. Wiedeman, Merrimac, N.H., assignor to Comet Products, Inc., Chelmsford, Mass.
Filed Nov. 6, 1981, Ser. No. 318,807
Term of patent 14 years
U.S. Cl. D7—14

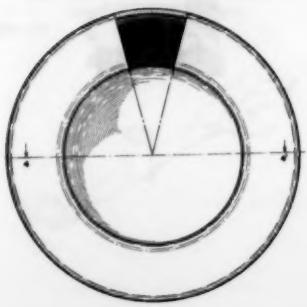


276,116
COMPARTMENTED TRAY AND COVER FOR FOOD OR THE LIKE
Mario E. Basil, 400 First St. SE., Washington, D.C. 20003
Filed Jun. 10, 1982, Ser. No. 387,606
Term of patent 14 years
U.S. Cl. D7—16

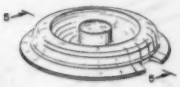


276,117
PLATE
Charles Solt, Stockton, N.J., assignor to Lenox, Incorporated, Lawrenceville, N.J.
Filed Dec. 3, 1981, Ser. No. 327,228
Term of patent 14 years
U.S. Cl. D7—36



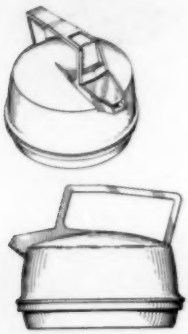


276,118
DISH COVER OR THE LIKE
Rino Conti, Stoughton, Mass.; Robert H. C. M. Daenen, Hekelgem, Belgium; Gerald M. Grusin, Chicago, Ill.; Augusto A. Picozza, Johnston, R.I., and James B. Swett, Altamonte Springs, Fla., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 7, 1982, Ser. No. 385,975
Term of patent 14 years
U.S. Cl. D7—40

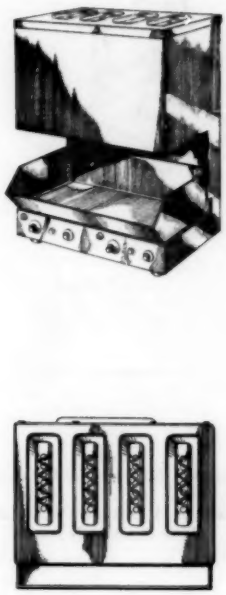


276,119
COLLAPSIBLE INSULATING CONTAINER
David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia
Filed Aug. 16, 1982, Ser. No. 408,647
Term of patent 14 years
U.S. Cl. D7—70

276,120
KETTLE
Harry Solomon, St. Laurent, Canada, assignor to Toastess Inc., Pointe Claire, Canada
Filed Apr. 6, 1982, Ser. No. 366,007
Claims priority, application Canada, Jan. 29, 1982, 29-01-82-5
Term of patent 14 years
U.S. Cl. D7—312



276,121
TOASTER
Anthony L. Kalloch, Bricktown; William C. Schneider, Toms River, and James G. Carville, Spring Lake, all of N.J., assignors to Alco Foodservice Equipment Company, Miami, Fla.
Filed Jul. 22, 1982, Ser. No. 400,861
Term of patent 14 years
U.S. Cl. D7—330



276,122

MICROWAVE OVEN

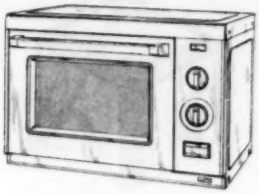
Michio Tanaka; Hisatoshi Matsushima; Kensuke Mizuma, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1982, Ser. No. 453,869

Claims priority, application Japan, Jul. 8, 1982, 57-30915

Term of patent 14 years

U.S. Cl. D7—351



276,123

ADJUSTABLE WRENCH

Donald L. Pyles, Dallas, Tex., assignor to Harold Levine; John L. Sigalos and Alfred E. Hall

Filed Jul. 6, 1981, Ser. No. 280,497

Term of patent 14 years

U.S. Cl. D8—17

276,124

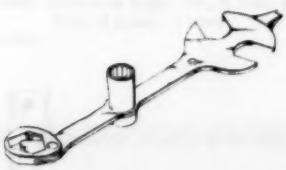
MULTI-USE HANDLE TOOL

Chin-Lang Liu, 13-1, Lane 5, Shu-I, Taichung, Taiwan, 400, Taiwan

Filed Jun. 21, 1982, Ser. No. 390,672

Term of patent 14 years

U.S. Cl. D8—22



276,125

REVERSING RATCHET SOCKET WRENCH

Richard B. Wright, Akron, and Hugh T. Greenlee, Gates Mills, both of Ohio, assignors to The Wright Tool and Forge Company, Barberton, Ohio

Filed Jun. 7, 1982, Ser. No. 386,027

Term of patent 14 years

U.S. Cl. D8—25

276,126

TOGGLE CLAMP

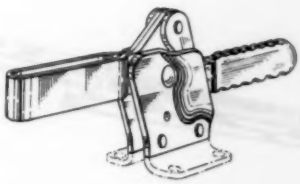
Ian B. Fraser, Codicote, and David A. Whitbread, Flamstead, both of England, assignors to HMC-Brauer Limited

Filed Jul. 20, 1981, Ser. No. 284,979

Claims priority, application United Kingdom, Mar. 11, 1981, 999355

Term of patent 14 years

U.S. Cl. D8—72



276,127

COLLAPSIBLE SCREWDRIVER

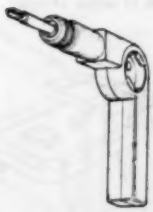
Peter Lee, Central, Hong Kong, assignor to Pioneer Hand Tools Industrial Co., Central, Hong Kong

Filed Jun. 22, 1982, Ser. No. 390,973

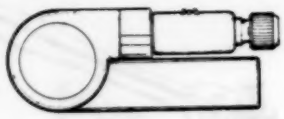
Claims priority, application United Kingdom, Apr. 6, 1982, 1006031

Term of patent 14 years

U.S. Cl. D8—84

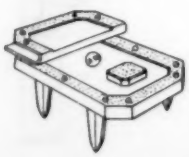


276,128
SCREWDRIVER
Peter Lee, Central, Hong Kong, assignor to Pioneer Hand Tools Industrial Co., Central, Hong Kong
Filed Jun. 22, 1982, Ser. No. 390,996
Claims priority, application United Kingdom, Apr. 1, 1982, 1005949
Term of patent 14 years
U.S. Cl. D8—84

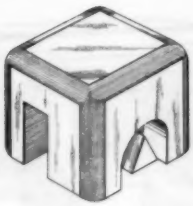


276,129
HAND FILE
Robert R. Hayes, Euclid, and George H. Frost, Kent, both of Ohio, assignors to Oatey Co., Cleveland, Ohio
Filed Aug. 14, 1981, Ser. No. 293,004
Term of patent 14 years
U.S. Cl. D8—90

276,130
LOCK FOR LUGGAGE OR SIMILAR TYPE CARRYING CONTAINER
Urs Gisiger, Selzach, Switzerland, assignor to AMIET AG, Oberdorf, Switzerland
Filed Dec. 6, 1982, Ser. No. 447,305
Claims priority, application Switzerland, Jul. 22, 1982, 72 526
Term of patent 14 years
U.S. Cl. D8—330



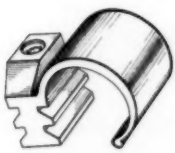
276,131
SLIDING DOOR AND WINDOW LOCK
Paul R. Fayle, P.O. Box 1121, Lexington, Va. 24450
Filed Dec. 13, 1982, Ser. No. 449,155
Term of patent 14 years
U.S. Cl. D8—330



276,132
COMBINATION WINDOW LOCK AND INSTALLATION GAUGE
Warner Loeb, 16 Millbrook Dr., Stony Brook, N.Y. 11790
Filed Dec. 13, 1982, Ser. No. 448,946
Term of patent 14 years
U.S. Cl. D8—331

276,133
WINDOW PULLEY SEAL
Gary D. Anderson, 920 W. 53rd St., Minneapolis, Minn. 55419
Filed Aug. 19, 1982, Ser. No. 409,453
Term of patent 14 years
U.S. Cl. D8—349

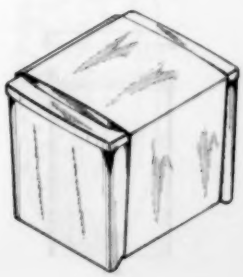
276,134
CABLE CLAMP
Per Ericsson, Hagavägen 9, S-778 00 Norberg, Sweden
Filed Nov. 10, 1982, Ser. No. 440,692
Claims priority, application Norway, Jun. 8, 1982, 63004
Term of patent 14 years
U.S. Cl. D8—396



276,135
RIVET OR THE LIKE
Akira Mizusawa, Fujisawa, Japan, assignor to Nifco Inc., Kanagawa, Japan
Filed Jun. 3, 1982, Ser. No. 384,565
Claims priority, application Japan, Dec. 9, 1981, 56/54124
Term of patent 14 years
U.S. Cl. D8—386

276,136
BOX
Pierre-Emmanuel Sebire, Le Chesnay, France, assignor to Societe d'Etudes de Chimie et de Therapie Appliquees Laboratoires de Cosmetologie Yves Rocher, La Gacilly, France
Filed Jun. 1, 1982, Ser. No. 383,756
Claims priority, application France, Dec. 1, 1981, 814112
Term of patent 14 years
U.S. Cl. D9—332

276,137
COMBINED CONTAINER AND OVERWRAP
Mary A. Vere, Flemington, N.J.; John Nelson, Bristol, Pa., and Robert M. Irvine, Englishtown, N.J., assignors to Johnson & Johnson Baby Products Company, Skillman, N.J.
Filed May 14, 1982, Ser. No. 378,159
Term of patent 14 years
U.S. Cl. D9—337

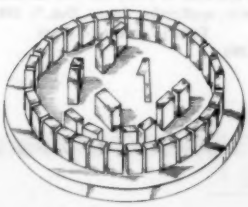


276,138
BOTTLE
Pierre-Emmanuel Sebire, Le Chesnay, France, assignor to Societe d'Etudes de Chimie et de Therapie Appliquees Laboratories de Cosmetologie Yves Rocher, La Gacilly, France
Filed Jun. 1, 1982, Ser. No. 383,761
Term of patent 14 years
U.S. Cl. D9—332

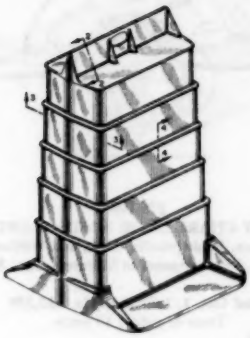
276,139
CONTAINER FOR LIQUIDS
Adrien P. Rayner, Iver, England, assignor to Metal Box Limited, Reading, England
Filed Aug. 12, 1981, Ser. No. 292,247
Claims priority, application United Kingdom, Feb. 21, 1981, 999033; Feb. 21, 1984, 999034; Feb. 21, 1984, 999035; Feb. 21, 1984, 999036; Feb. 21, 1984, 999037
Term of patent 14 years
U.S. Cl. D9—352

276,140
BOTTLE TOP
Abraham Y. Schultz, 1233 Guelbreth La., Creve Coeur, Mo. 63141
Filed Apr. 19, 1982, Ser. No. 369,524
Term of patent 14 years
U.S. Cl. D9—380

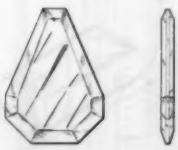
276,141
SUNDIAL FACEPIECE
Stephen N. Sharpe, Boston, Mass., assignor to The Idea Works, Inc., Pequannock, N.J.
Filed Jan. 27, 1982, Ser. No. 343,192
Term of patent 14 years
U.S. Cl. D10—45



276,142
HIGHWAY BARREL
Alvin R. Dobrin, Beachwood, Ohio, assignor to Electro-General Plastics Corp., Shaker Heights, Ohio
Filed Oct. 13, 1981, Ser. No. 311,150
Term of patent 14 years
U.S. Cl. D10—106



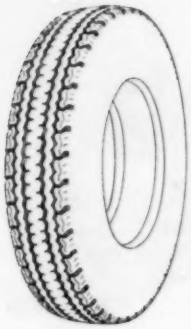
276,143
ORNAMENT
William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Feb. 7, 1983, Ser. No. 464,329
Term of patent 14 years
U.S. Cl. D11—121



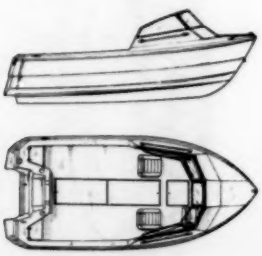
276,144
ORNAMENT
William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Jun. 25, 1982, Ser. No. 392,329
Term of patent 14 years
U.S. Cl. D11—121

276,145
TIRE
Peter J. Walker, Bradford-on-avon, England, assignor to Avon Tyres Limited, Melksham, England
Filed Jul. 26, 1982, Ser. No. 401,537
Claims priority, application United Kingdom, Feb. 1, 1982, 1004875
Term of patent 14 years
U.S. Cl. D12—136

276,146
TIRE
Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 30, 1982, Ser. No. 412,629
Term of patent 14 years
U.S. Cl. D12—142

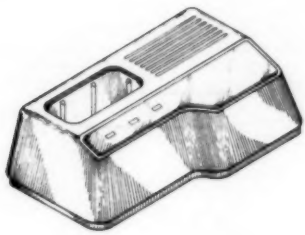


276,147
BOAT
Juichi Arima, King County, Wash., assignor to Arima Marine International, Inc., Seattle, Wash.
Filed Jan. 4, 1982, Ser. No. 336,569
Term of patent 14 years
U.S. Cl. D12—314

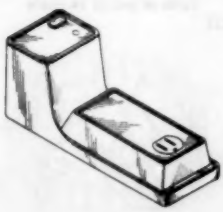


276,148
WATER BICYCLE
Terry J. Walker, House 2, 35 Marks St., Naremburn, New South Wales 2065, Australia, assignor to Terry James Walker, New South Wales, Australia
Filed May 6, 1981, Ser. No. 260,872
Claims priority, application Australia, Nov. 13, 1980, 82596
Term of patent 14 years
U.S. Cl. D12—306

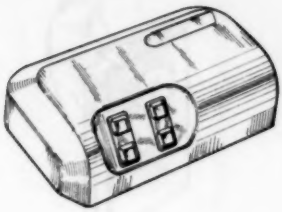
276,149
BATTERY CHARGER OR SIMILAR ARTICLE
John A. Eckmann, Baldwinsville, N.Y., and William J. Scheid, Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 1, 1982, Ser. No. 432,239
Term of patent 14 years
U.S. Cl. D13—5



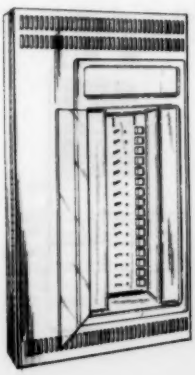
276,150
AUTOMATIC OUTLET CONTROL
John Marshall, 1300 Spear St., South Burlington, Vt. 05401, and Henry B. Clark, Jr., Box 117, Underhill Center, Vt. 05490
Filed Jan. 18, 1982, Ser. No. 340,185
Term of patent 14 years
U.S. Cl. D13—30



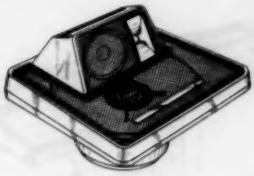
276,151
**PAIR OF PUSH-BUTTON CONTROL SWITCHES FOR SLIDABLE WINDOWS OF AN AUTOMOTIVE VEHICLE**
Massimo Vitaloni, Rivalta, Italy, assignor to Arcoflex S.p.A., Turin, Italy
Filed Oct. 7, 1981, Ser. No. 309,345
Claims priority, application Italy, Apr. 7, 1981, 53116/81[U]
Term of patent 14 years
U.S. Cl. D13—32



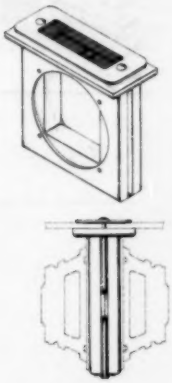
276,152
**CONTROLLER HOUSING**
Charles M. Ault, Winchester, Mass., and Steven G. Landry, Litchfield, N.H., assignors to Andover Controls Corporation, Andover, Mass.
Filed Jan. 20, 1982, Ser. No. 341,125
Term of patent 14 years
U.S. Cl. D13—35



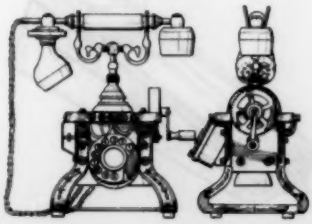
276,153
**LOUDSPEAKER**
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 12, 1982, Ser. No. 367,521
Claims priority, application Japan, Oct. 14, 1981, 56-45675[U]
Term of patent 14 years
U.S. Cl. D14—30



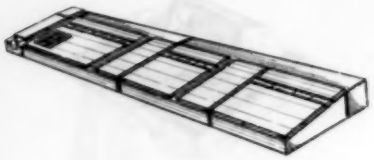
276,154
**VENTED WOOFER FRAME**
Peter H. Werback, 8115 Berg St., Roseville, Calif. 95678
Filed May 10, 1982, Ser. No. 376,451
Term of patent 14 years
U.S. Cl. D14—37



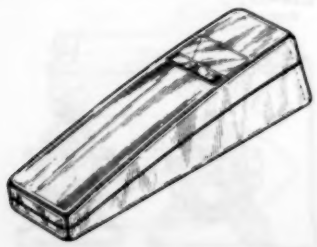
276,155
**TELEPHONE SET**
Vincenzina Marzovilli, 30, Via Ronchi I 20134, Milan, Italy
Filed Jun. 29, 1982, Ser. No. 393,525
Claims priority, application Italy, May 7, 1981, 21661 A/81
Term of patent 14 years
U.S. Cl. D14—53



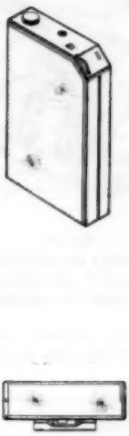
276,156
COMBINATION TELEPHONE, REMOTE CONTROL DEVICE, AND SECURITY DEVICE
John W. Goodin, Long Beach, and Charlie A. Patterson, Costa Mesa, both of Calif., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 2, 1982, Ser. No. 384,312
Term of patent 14 years
U.S. Cl. D14—53



276,157
TELEPHONE
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Sidcup, England
Filed Dec. 4, 1981, Ser. No. 327,564
Claims priority, application United Kingdom, Jun. 4, 1981, 1000803
Term of patent 14 years
U.S. Cl. D14—53

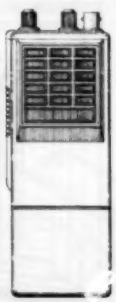


276,158
PORTABLE STEREO RECEIVER HOUSING
C. C. Lee; D. H. Louie, and Y. M. Tam, all of Kowloon, Hong Kong, assignors to Atlas Electronics Manufacturing Limited, Kowloon, Hong Kong
Filed May 13, 1982, Ser. No. 377,856
Term of patent 14 years
U.S. Cl. D14—68



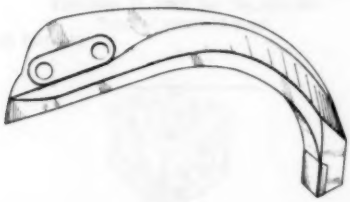


276,159
PORTABLE RADIO TRANSCEIVER OR THE LIKE
Robert R. Huntington, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Jun. 7, 1982, Ser. No. 385,662
Term of patent 14 years
U.S. Cl. D14—72

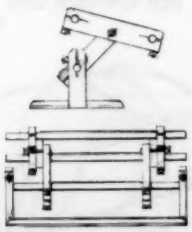


276,160
INTERNAL COMBUSTION ENGINE POWER UNIT
Lloyd H. Tuggle, Shreveport; Ronald C. Loyd, Keithville, and Charles A. Fain, Shreveport, all of La., assignors to Emerson Electric Co., Shreveport, La.
Filed Jul. 14, 1982, Ser. No. 397,988
Term of patent 14 years
U.S. Cl. D15—1

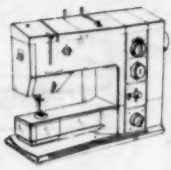
276,161
BARK CUTTER FOR DEBARKING MACHINE
Veikko L. Valo, Lohja, Finland, assignor to Valon Kone Oy, Lohja, Finland
Filed Jul. 8, 1981, Ser. No. 281,361
Claims priority, application Finland, May 27, 1981, 401/81
Term of patent 14 years
U.S. Cl. D15—28

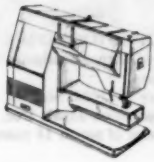


276,162
ADJUSTABLE NEEDLEWORK FRAME
Raymond R. Rancourt, 9456 Beaver Creek Dr., Mentor, Ohio 44060
Filed Sep. 23, 1982, Ser. No. 422,213
Term of patent 14 years
U.S. Cl. D15—66



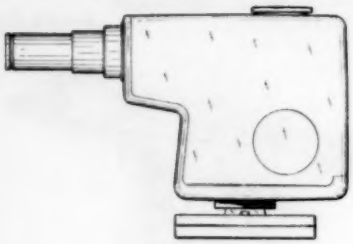
276,163
SEWING MACHINE
Roger H. Ramsey, Wadsworth, and Dale A. Panasewicz, Parma, both of Ohio, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik, Steckborn, Switzerland
Filed Sep. 30, 1981, Ser. No. 307,114
Term of patent 14 years
U.S. Cl. D15—69



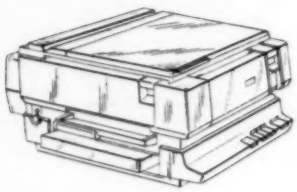


276,164
DENTAL METALLIC CASTING INGOT
John J. Blair, and George T. Eden, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.
Filed Sep. 8, 1981, Ser. No. 299,705
Term of patent 14 years
U.S. Cl. D15—144

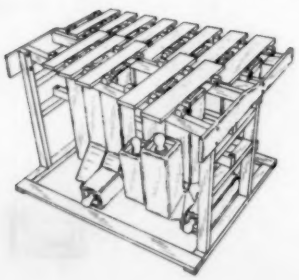
276,165
STILL PROJECTOR
Raymond Spilman, Darien, Conn., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.
Filed Feb. 1, 1982, Ser. No. 344,579
Term of patent 14 years
U.S. Cl. D16—20



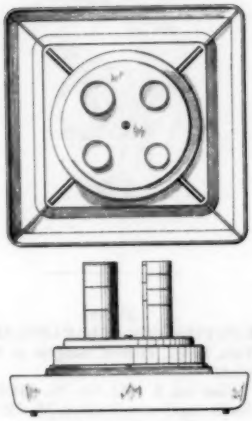
276,166
ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 28, 1982, Ser. No. 383,105
Claims priority, application Japan, Dec. 17, 1981, 56-56094
Term of patent 14 years
U.S. Cl. D16—31



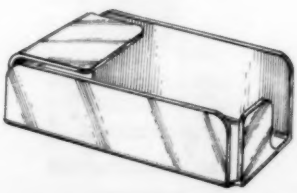
276,167
BASS MARIMBA
C. C. Banta, 232 Wyoming St., Pasadena, Calif. 91103
Filed Jun. 30, 1980, Ser. No. 164,362
Term of patent 14 years
U.S. Cl. D17—23



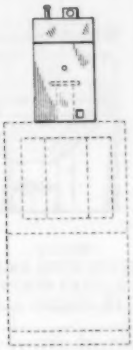
276,168
COIN TRAY OR SIMILAR ARTICLE
Stanley H. Katz, 2712 Jeremy Ct., Apt. A, Baltimore, Md. 21209
Filed Jul. 30, 1982, Ser. No. 403,478
Term of patent 14 years
U.S. Cl. D18—3



276,169
DESK TRAY FOR HOLDING NOTE PAPER
David Battle, Yellow Springs, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio
Filed May 3, 1982, Ser. No. 374,393
Term of patent 14 years
U.S. Cl. D19—92



276,170
COIN MECHANISM ENCLOSURE FOR A NEWSPAPER VENDOR
Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301
Filed Aug. 21, 1981, Ser. No. 295,215
Term of patent 14 years
U.S. Cl. D20—6

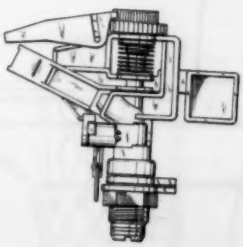


276,171
NOVELTY TOY
Andrew J. Filipowicz, 10296 Kenny La., San Jose, Calif. 95127, assignor to Andrew J. Filipowicz, Santa Clara, Calif.
Filed Sep. 27, 1982, Ser. No. 424,543
Term of patent 14 years
U.S. Cl. D21—59

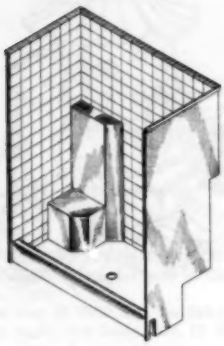
276,172
SIMULATIVE TOY CAR
Katsushi Murakami, Tokyo, Japan, assignor to Bandai Co., Ltd., Tokyo, Japan
Filed Mar. 5, 1982, Ser. No. 355,266
Term of patent 14 years
U.S. Cl. D21—128

276,173
TOY TROLLEY
Robert K. Allen; Steven Toth, and David Windslow, all of Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jun. 7, 1982, Ser. No. 386,151
Term of patent 14 years
U.S. Cl. D21—129

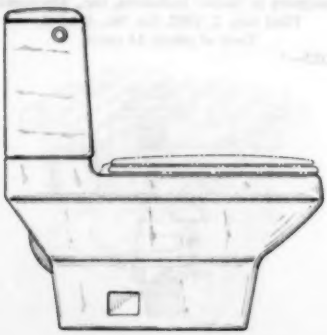
276,174
PULSATOR HEAD FOR A SPRINKLER
Ho Chow, River Edge, N.J., and Gordon R. Perry, New York, N.Y., assignors to Melnor Industries, Inc., Moonachie, N.J.
Filed Aug. 2, 1982, Ser. No. 404,540
Term of patent 14 years
U.S. Cl. D23—7



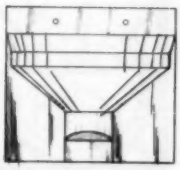
276,175
SHOWER STALL
Gloria K. McMillan, San Bernardino, and William J. Schmidt, Costa Mesa, both of Calif., assignors to Kimstock, Inc., Santa Ana, Calif.
Filed Aug. 17, 1981, Ser. No. 293,516
Term of patent 14 years
U.S. Cl. D23—57

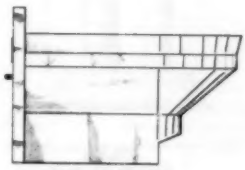


276,176
WATER CLOSET OR SIMILAR ARTICLE
Jack N. Kaiser, Danville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Feb. 8, 1982, Ser. No. 346,985
Term of patent 14 years
U.S. Cl. D23—65

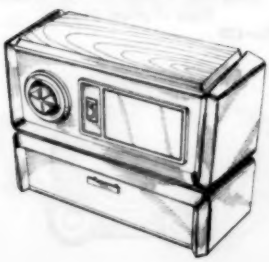


276,177
TOILET BOWL
Timothy B. Willoughby, 754 Balroyal Ct., Indianapolis, Ind. 46234
Filed Nov. 18, 1982, Ser. No. 442,593
Term of patent 14 years
U.S. Cl. D23—65

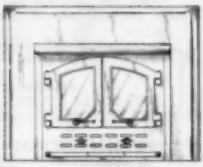




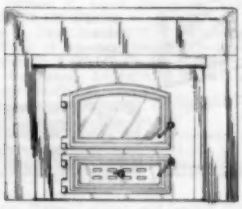
276,178
DRYER
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Division of Ser. No. 377,305, May 12, 1982,. This application Feb. 23, 1984, Ser. No. 582,829
Term of patent 14 years
U.S. Cl. D23—74



276,179
FIREPLACE INSERT WITH INTERCHANGEABLE DOOR PANELS
Charles F. Buehler, 6540 Kirkville Rd., E. Syracuse, N.Y. 13057
Filed Jul. 14, 1982, Ser. No. 398,157
Term of patent 14 years
U.S. Cl. D23—94

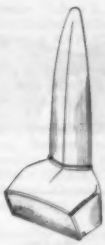


276,180
FIREPLACE INSERT WITH INTERCHANGEABLE DOOR PANELS
Charles F. Buehler, 6540 Kirkville Rd., East Syracuse, N.Y. 13057
Filed Jul. 14, 1982, Ser. No. 398,156
Term of patent 14 years
U.S. Cl. D23—94

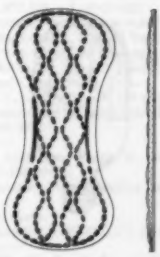


276,181
OIL HEATER
Daisaku Mori, and Youichi Takahashi, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,791
Claims priority, application Japan, Feb. 19, 1982, 57-7130
Term of patent 14 years
U.S. Cl. D23—121

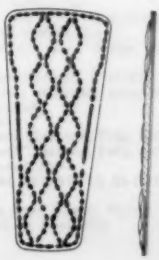
276,182
AIR CIRCULATOR
Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064
Filed Sep. 30, 1982, Ser. No. 432,121
Term of patent 14 years
U.S. Cl. D23—151



276,183
THIN ABSORBENT PAD
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 26, 1982, Ser. No. 371,909
Term of patent 14 years
U.S. Cl. D24—51



276,184
THIN ABSORBENT PAD
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 26, 1982, Ser. No. 371,911
Term of patent 14 years
U.S. Cl. D24—51

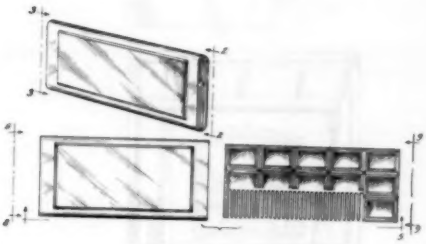


276,185
BUILDING STRUCTURE
Emery C. Stewart, Jr., 1317 Eagle NW., Grand Rapids, Mich. 49504
Filed Oct. 23, 1981, Ser. No. 314,203
Term of patent 14 years
U.S. Cl. D25—31

276,186
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi, and Yoshio Kojima, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Dec. 23, 1981, Ser. No. 333,902
Claims priority, application Japan, Dec. 15, 1980, 55-52549
Term of patent 14 years
U.S. Cl. D26—3

276,187
TAIL LIGHT VISOR
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed May 26, 1982, Ser. No. 382,079
Term of patent 14 years
U.S. Cl. D26—139

276,188
COMBINED COMB AND MIRRORED CASE THEREFOR
Mark J. Metzner, 650 Anthony Trail, Northbrook, Ill. 60062
Filed Jun. 18, 1982, Ser. No. 389,643
Term of patent 14 years
U.S. Cl. D28—25



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 30TH DAY OF OCTOBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Nilson Machine Co., Inc., The: *See*—
Carlson, Robert E.; and Skilton, Halsey W., 4,479,376, Cl. 72-455.000.

A. H. Robins Company, Inc.: *See*—
Lo, Young S.; and Taylor, Chandler R., Jr., 4,480,100, Cl. 546-307.000.

A/S Kongsberg Vapenfabrikk: *See*—
Skoe, Ivar H., 4,479,755, Cl. 415-1.000.

Abe, Kuniomi. Microscope. 4,479,700, Cl. 350-523.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Sakakibara, Susumu, 4,480,280, Cl. 360-78.000.

Abel, Edward P.: *See*—
Bailey, David B.; and Abel, Edward P., 4,480,080, Cl. 526-318.000.

ACF Industries, Incorporated: *See*—
Pearson, Arthur C., 4,479,567, Cl. 188-47.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,479,573, Cl. 198-399.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Gauging assembly for capsule orienting and turning apparatus. 4,479,573, Cl. 198-399.000.

Acorn Engineering Company: *See*—
Morris, Earl L.; Hafner, Walter V.; and Hahn, Ron T., 4,480,163, Cl. 200-331.000.

Acosta, Raul E.; and Yarmchuk, Edward J., to International Business Machines Corporation. Plating rate monitor. 4,479,980, Cl. 427-10.000.

Acra Electric Corporation: *See*—
Hummel, Matt N., 4,480,174, Cl. 219-331.000.

Adams, Ladd M.: *See*—
Gill, Elbert R.; and Adams, Ladd M., 4,479,558, Cl. 175-320.000.

Adams, Roy D.: *See*—
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,479,428, Cl. 100-210.000.

Adcock, James L.; Pace, Marshall O.; and Christophorou, Loucas G., to United States of America, Energy. Contaminant trap for gas-insulated apparatus. 4,480,147, Cl. 174-14.00R.

Adler, Alan J. Boomerang. 4,479,655, Cl. 273-425.000.

Ag-Chem Equipment Co., Inc.: *See*—
Takata, Har.y H., 4,479,444, Cl. 111-7.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,479,987, Cl. 427-402.000.
Schon, Erwin; Schranz, Karl-Wilhelm; and Wolff, Erich, 4,480,027, Cl. 430-523.000.

Agip Petroli S.p.A.: *See*—
Koch, Paolo; Mattei, Luciano; and Gerbaz, Giampaolo, 4,479,888, Cl. 252-357.000.

Aguilo, Adolfo: *See*—
Horlenko, Theodore; and Aguilo, Adolfo, 4,480,122, Cl. 560-239.000.

Aigo, Seiichiro. Unitary probe assembly. 4,480,223, Cl. 324-158.00P.

Aiki, Kunio; and Ojima, Masahiro, to Hitachi, Ltd. Optical pickup. 4,480,325, Cl. 369-122.000.

Air Preheater Company, Inc., The: *See*—
Rhodes, Robin B., 4,479,534, Cl. 165-142.000.

Air Products and Chemicals, Inc.: *See*—
McWhorter, Thomas E.; and Halper, Barry J., 4,479,362, Cl. 62-63.000.
Newton, Charles L.; and Fuini, Dennis L., 4,479,350, Cl. 60-655.000.

Ainin Seiki Kabushiki Kaisha: *See*—
Tsubouchi, Kaoru; and Funahashi, Akira, 4,479,915, Cl. 264-249.000.

AIT Industries, Inc.: *See*—
Stern, Theodore J.; and Beachler, Larry A., 4,479,332, Cl. 51-277.000.

Aiuchi, Susumu: *See*—
Otsubo, Toru; Aiuchi, Susumu; and Kamimura, Takashi, 4,479,848, Cl. 156-626.000.

Ajima, Takashi: *See*—
Koshino, Yutaka; Ohshima, Jiro; Ajima, Takashi; and Yonezawa, Toshio, 4,479,830, Cl. 148-1.500.

Akahori, Hiroyuki: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,480,002, Cl. 428-402.200.

Akerberg, Denis W.; and Rude, Carl A., to QO Chemicals, Inc. Method and composition for a ramming mix in aluminum reduction cells. 4,479,913, Cl. 264-29.500.

Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., to Vsesojuzny Nauchnoissledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki. Composition for sealing wound surfaces. 4,479,933, Cl. 424-81.000.

Akiyama, Yasuhiro: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.

Akzona Incorporated: *See*—
Seibert, Karl, 4,479,887, Cl. 252-309.000.

Alaria, Gian B.; and Preti, Roberto, to Cselt - Centro Studi E Laboratori Telecomunicazioni S.p.A. Method of and system for communication via satellite. 4,480,328, Cl. 370-63.000.

Albrecht, Georg F.; and Mourou, Gerard, to University of Rochester, The. Optical pulse correlation measurement. 4,480,192, Cl. 250-550.000.

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Kirchoff, Francis D., 4,480,159, Cl. 200-42.00T.

Alexander, Delores J.: *See*—
Kordomenos, Panagiotis I.; Alexander, Delores J.; and Thomson, David M., 4,480,084, Cl. 528-118.000.

Alexandrovich, Peter S.; and Merrill, Stewart H., to Eastman Kodak Company. Method for forming a self-fixed image on a nonporous surface at ambient temperature. 4,480,022, Cl. 430-119.000.

Alfa-Laval AB: *See*—
Olenfalk, Lars, 4,479,426, Cl. 100-37.000.

Alfano, Robert R. Method and apparatus for detecting the presence of caries in teeth using visible light. 4,479,499, Cl. 128-665.000.

Alfred University Research Foundation, Inc.: *See*—
Funk, James E., 4,479,806, Cl. 44-51.000.

Alivo, Martin J., Jr. Bowlers wrist brace. 4,479,648, Cl. 273-54.00B.

Allaire, Roger A.; Socha, Louis S., Jr.; and Van Dewoestine, Robert V., to Corning Glass Works. Solid fuel heating appliance and combustor apparatus therefor. 4,479,921, Cl. 422-180.000.

Allegheny Ludlum Steel Corporation: *See*—
Maringer, Robert E., 4,479,528, Cl. 164-423.000.

Allen, Jefferson K. Method for cleaning and clearing plastic surfaces. 4,479,985, Cl. 427-164.000.

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Miller, John A.; Anderson, Ralph E.; and Allen, Marvin M., 4,479,293, Cl. 29-156.80R.

Allen, Milton F. Currency identification method. 4,480,177, Cl. 235-379.000.

Allen Organ Company: *See*—
Haberstumpf, Harold E., 4,479,415, Cl. 84-439.000.

Allied Corporation: *See*—
Anderson, Philip M., III; Reich, Ronald K.; and Raskin, Donald, 4,479,389, Cl. 73-651.000.
Dudley, Carl K.; and Mattson, Richard W., 4,480,222, Cl. 324-126.000.
Henschel, Claude, 4,480,016, Cl. 428-678.000.
Resch, Alois R., 4,479,301, Cl. 29-721.000.

Alman, David H., to Du Pont de Nemours, E. I., and Company. Three direction measurements for characterization of a surface containing metallic particles. 4,479,718, Cl. 356-405.000.

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Alphonse, Everett J.; and Alphonse, Everett, Sr., 4,479,340, Cl. 52-646.000.

Alphonse, Everett J.; and Alphonse, Everett, Sr., to John Goudie Associates, Inc. Quick manual lock for display frames. 4,479,340, Cl. 52-646.000.

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Alton Packaging Corporation: *See*—
Russell, Dennis E., 4,479,318, Cl. 40-154.000.

Aluminum Company of America: *See*—
Hawkins, Ronald G.; and Muniak, John E., 4,480,149, Cl. 174-42.000.
Tarcy, Gary P., 4,479,379, Cl. 73-23.000.

Alvarez, Luis W. Dead reckoning range finding device for cart. 4,480,310, Cl. 364-450.000.

Alza Corporation: *See*—
Urquhart, John; and Theeuwes, Felix, 4,479,793, Cl. 604-85.000.
Urquhart, John; and Theeuwes, Felix, 4,479,794, Cl. 604-85.000.

Amada Company Limited: *See*—
Taguchi, Masayuki, 4,479,410, Cl. 83-13.000.

Amano, Hisao: *See*—
Yasui, Yoshiharu; Seiki, Kazuo; Suzuki, Yoshihisa; and Amano, Hisao, 4,479,348, Cl. 57-404.000.

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Dauplaise, David L., 4,479,903, Cl. 260-455.00A.

Ampex Corporation: *See—*
Coleman, Charles H., Jr., 4,480,271, Cl. 358-310.000.
Coleman, Charles H., Jr., 4,480,274, Cl. 360-31.000.
Fawkes, John S., 4,480,275, Cl. 360-46.000.

Analgeic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,479,956, Cl. 424-253.000.

Ancos Co., Ltd.: *See—*
Shimizu, Kazuo, 4,479,732, Cl. 401-107.000.

Anderson, Howard M. Wrist watch weather radio. 4,480,253, Cl. 340-825.690.

Anderson, Philip M., III; Reich, Ronald K.; and Raskin, Donald, to Allied Corporation. Tuned vibration detector. 4,479,389, Cl. 73-651.000.

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Miller, John A.; Anderson, Ralph E.; and Allen, Marvin M., 4,479,293, Cl. 29-156.80R.

Anderson, Robert A.: *See—*
Welsh, James W.; and Anderson, Robert A., 4,479,666, Cl. 285-4.000.

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Ando, Yasuo, to Meidensha Electric Mfg. Co., Ltd. Zinc dendrite inhibitor. 4,479,856, Cl. 204-55.00R.

Andros Analyzers Incorporated: *See—*
Burough, Irvin G.; and Williams, Kevin G., 4,480,190, Cl. 250-343.000.

Angelini, Leonello: *See—*
Robertiello, Andrea; Angelini, Leonello; and Degen, Ludwig, 4,479,978, Cl. 426-636.000.

Angenieux CLB S. A.: *See—*
Defour, Paule; and Dumas, Antoine, 4,479,662, Cl. 280-281.00R.

Anic S.p.A.: *See—*
Esposito, Antonio; Neri, Carlo; and Buonomo, Franco, 4,480,135, Cl. 568-385.000.

Anis, Aziz Y. Irrigating vectis. 4,479,802, Cl. 604-275.000.

Anne Company, Ltd.: *See—*
Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, 4,480,000, Cl. 428-284.000.

Antoniades, Harry N. Method for extraction localization and direct recovery of platelet derived growth factor. 4,479,896, Cl. 260-112.00B.

Antonius, John I. Open-end ratchet wrench. 4,479,409, Cl. 81-58.300.

Aoki, Earl S.: *See—*
Palazzolo, Faro D.; Magnuson, Roland A.; and Aoki, Earl S., 4,479,568, Cl. 192-67.00R.

Aoyagi, Kenichi: *See—*
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,479,469, Cl. 123-308.000.

Aoyama, Keizo, to Fujitsu Limited. Semiconductor memory device. 4,480,321, Cl. 365-189.000.

Aperm of South Carolina: *See—*
Sherno, Stanley A., 4,480,053, Cl. 521-54.000.

Appelt, Bernd K.; Schmitt, George P.; and Shipley, John F., to International Business Machines Corporation. Method and composition for applying coatings on printed circuit boards. 4,479,983, Cl. 427-54.100.

Applied Power Inc.: *See—*
Wendl, Daniel P.; and Lukezich, Paul J., 4,479,305, Cl. 33-180.0AT.

Applied Solar Engineering, Inc.: *See—*
Manning, Robert A.; and Wisneski, Thomas P., 4,479,486, Cl. 126-415.000.

Arad, Abraham: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,479,326, Cl. 446-23.000.

Arai, Yoshinobu: *See—*
Hayashi, Masaki; Konishi, Yoshitaka; and Arai, Yoshinobu, 4,479,966, Cl. 424-305.000.

Arbeille, Yves; and Lucas, Jean, to Centre National du Machinisme Agricole, du Genie Rural, des Eaux et des Forets (CEMAGREF). Device for dispersing a fluid in a jet of fluid of higher density, particularly of a gas in a liquid. 4,479,908, Cl. 261-62.000.

Archer, Steven K., to Plessey Overseas Limited. Electrical device package. 4,480,148, Cl. 174-51.000.

Arcstart, Inc.: *See—*
Jackson, George R.; and Frick, Donald C., 4,479,377, Cl. 73-3.000.

Arkansas Patents, Inc.: *See—*
Davis, Robert E., 4,479,484, Cl. 126-362.000.

Armelin, Michel, to Societe anonyme dite: Machines Chambon. Ink fountain, incorporating individually regulated metering segments, for a printing machine. 4,479,434, Cl. 101-365.000.

Arnaud, Henri, to Regie Nationale des Usines Renault. Device for controlling the recirculation of exhaust gases in internal combustion engines. 4,479,478, Cl. 123-571.000.

Arndt, Friedrich; Franke, Heinrich; Schmidt, Erich; and Puttner, Reinhold, to Schering Aktiengesellschaft. Substituted carbanilic acid esters and herbicidal composition containing same. 4,479,822, Cl. 71-111.000.

Arnold, Bruce E.: *See—*
Jones, Gary D.; Horey, Leonard I.; Kurland, Marvin; and Arnold, Bruce E., 4,479,448, Cl. 112-275.000.

Arpe, Hans-Jurgen; and Litterer, Heinz, to Hoechst Aktiengesellschaft. Process for the manufacture of o-toluidine and/or m-toluidine and/or p-toluidine. 4,480,128, Cl. 564-424.000.

Asai, Ryuichi: *See—*
Okamoto, Takeshi; Asai, Ryuichi; and Minagawa, Shoichi, 4,480,209, Cl. 310-313.00B.

Asaka, Hitoshi. Eye hole for roping reinforced by grommet metal fittings as in sheet-like articles. 4,479,287, Cl. 24-141.000.

Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, to Mitsui Toatsu Chemicals, Incorporated. Dyestuff-containing microscopic capsule suspension for record materials. 4,480,002, Cl. 428-402.200.

Ashcraft, Robert W.; and Koenigkramer, Rusty E., to Du Pont de Nemours, E. I., and Company. Stable dispersions for use in photographic film having an opaque backing layer. 4,480,026, Cl. 430-510.000.

Ashland Oil, Inc.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,480,047, Cl. 502-65.000.
Winters, Jonathan K.; and Savell, Fred B., III, 4,479,981, Cl. 427-27.000.

Askins, William E., to Woodstream Corporation. Animal trap with improved immunity to false actuation. 4,479,324, Cl. 43-92.000.

AT&T Bell Laboratories: *See—*
Levy, Nicha; and Patel, Parbhubhai D., 4,479,984, Cl. 427-54.100.

AT&T Information Systems: *See—*
Miller, Robert R., II; Small, Charles; and Stothoff, John H., 4,480,178, Cl. 235-380.000.

AT&T Technologies, Inc.: *See—*
Haynes, Richard; Jackson, Anna M.; and Zierold, Martin K., 4,479,922, Cl. 423-22.000.
Milligan, Edward J.; Nauman, Delbert A.; and Quick, Nathaniel R., 4,480,014, Cl. 428-672.000.
Thompson, Fred E., 4,479,991, Cl. 428-76.000.

Ateliers De La Rive: *See—*
Defour, Paule; and Dumas, Antoine, 4,479,662, Cl. 280-281.00R.

Atlantic Richfield Company: *See—*
Lowther, Frank E., 4,479,919, Cl. 422-127.000.

AuClair, Christopher J.: *See—*
Lu, Chin H.; and AuClair, Christopher J., 4,480,021, Cl. 430-106.600.

Auditore-Hargreaves, Karen, to Du Pont de Nemours, E. I., and Company. Immunoglobulin half-molecules and process for producing hybrid antibodies. 4,479,895, Cl. 260-112.00B.

Aumard, Jean P.: *See—*
Mairot, Guy; and Aumard, Jean P., 4,479,562, Cl. 177-256.000.

Automatic Orange Juicer Corp.: *See—*
Nelson, Stewart C., 4,479,425, Cl. 99-507.000.

Automation Industries, Inc.: *See—*
Kutnyak, Thomas A.; and Campbell, Arthur R., 4,479,835, Cl. 156-143.000.

Avery, John L.: *See—*
Bartimes, George F.; Avery, John L.; Blomquist, Leonard A.; and McDonald, Stephen B., 4,479,644, Cl. 271-107.000.

Awalt, Thomas Y., Jr., to Deep Seven Co. Anchor handling and storage device. 4,479,452, Cl. 114-210.000.

Awerbuch, Leon; and Rogers, Alfred N., to Electric Power Research Institute, Inc. Venturi flash circulator for geothermal apparatus. 4,479,351, Cl. 60-641.500.

Ayres, Richard A.: *See—*
Wesley, Richard H.; and Ayres, Richard A., 4,479,680, Cl. 299-14.000.

B. F. Goodrich Company, The: *See—*
Lai, John T.; and Son, Pyong N., 4,480,092, Cl. 544-113.000.

B.N., S.A.: *See—*
Beistegui Chiraporzu, Jose L., 4,479,646, Cl. 272-73.000.

Babcock & Wilcox Company, The: *See—*
Schluderberg, Donald C., 4,479,353, Cl. 60-659.000.

Babitzka, Rudolf, to Robert Bosch GmbH. Pressurized fuel injection system for multi-cylinder engines, particularly diesel engines. 4,479,475, Cl. 123-446.000.

Bachler, Werner; and Heisig, Rolf, to Leybold-Heraeus GmbH. Cryopump. 4,479,360, Cl. 62-55.500.

Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., to Data General Corporation. Digital data processing system using unique ALU register files and micro-instruction stacks. 4,480,306, Cl. 364-200.000.

Bachmann, Heinrich; and Portmann, Plato, to Wella Aktiengesellschaft. Agent for oxidative dyeing of hair. 4,479,803, Cl. 8-406.000.

Baggio, Edward G.: *See—*
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.

Bailey, David B.; and Abel, Edward P., to Eastman Kodak Company. Vinyl-ester polymeric timing layer for color transfer assemblages. 4,480,080, Cl. 526-318.000.

Bakal, Abraham I.; and Crossman, Tommy L., to Corning Glass Works. Use of lactose-hydrolyzed whey in chewing gum. 4,479,969, Cl. 426-3.000.

Baker Cac, Inc.: *See—*
Goans, Kip B., 4,479,506, Cl. 137-73.000.

Baker, Lewin T.; and Orlowski, Eugene J., Jr., to General Electric Company. Method and apparatus for digital automatic frequency control of chirped oscillator. 4,480,232, Cl. 331-1.00A.

Baker Oil Tools, Inc.: *See*—
Callihan, Rudy B.; Goad, Bobby F.; and Miller, Gary A., 4,479,544, Cl. 166-290.000.
Stout, Gregg W.; and Nelson, John A., 4,479,556, Cl. 175-4.600.
Baldwin-Gegenheimer Corporation: *See*—
MacPhee, John; and Van Raalte, Peter, 4,479,433, Cl. 101-364.000.
Balliet, Karl E., to Rubatex Corporation. Athletic padding. 4,479,269, Cl. 2-23.000.
Balz, Helmut. Remote steam system having common recirculation of condensate and method for condensate recirculation. 4,479,606, Cl. 237-67.000.
Banik, Gary J.; EerNisse, Errol; Kistler, Walter P.; and Paros, Jerome, to Quartex, Inc. Resonator force transducer assembly. 4,479,391, Cl. 73-862.590.
Barber-Colman Company: *See*—
Johnson, Stuart J.; and Fransson, George E., 4,479,745, Cl. 409-12.000.
Barber-Greene Company: *See*—
Burkhart, George M.; White, Joseph M.; and Witkonis, Diane M., 4,479,591, Cl. 222-317.000.
Barnette, William E., to Du Pont de Nemours, E. I., and Company. Fluorination of carbanions with N-fluoro-N-alkylsulfonamides. 4,479,901, Cl. 260-239.0BD.
Barr & Stroud Limited: *See*—
Neil, Iain A., 4,479,695, Cl. 350-1.300.
Barthelemy, Philippe; Baurand, Gilles; and Roussel, Francois, to La Telemecanique Electrique. Circuit for supplying a control contact with power and application thereof to the control of a rest time delay of a relay. 4,480,194, Cl. 307-132.00E.
Bartimes, George F.; Avery, John L.; Blomquist, Leonard A.; and McDonald, Stephen B., to Continental Plastic Containers, Inc. In-mold labeler. 4,479,644, Cl. 271-107.000.
Barton, Hugh M., Jr., to Phillips Petroleum Company. Method and apparatus for radon control. 4,479,857, Cl. 204-130.000.
Basa, Thomas P.: *See*—
Carothers, Charles H.; Garau, John E.; and Basa, Thomas P., 4,480,245, Cl. 337-180.000.
BASF Aktiengesellschaft: *See*—
Bung, Richard; Giesbrecht, Hartmut; Leuckel, Wolfgang; and Klimisch, Hans-Joachim, 4,479,493, Cl. 128-204.180.
Fischer, Rolf; and Weitz, Hans-Martin, 4,480,123, Cl. 560-244.000.
Kube, Wolfgang; Kegel, Robert; Valentin, Guenter; and Staufer, Dieter, 4,479,768, Cl. 425-192.00R.
Lotsch, Wolfgang; and Kemper, Reinhard, 4,480,097, Cl. 544-296.000.
Mueller, Herbert, 4,480,124, Cl. 560-248.000.
Zeidler, Georg; Hansen, Guenter; and Schulte, Wolfgang, 4,479,906, Cl. 260-169.000.
Basseville, Philippe: *See*—
Gougouyan, Yves; and Basseville, Philippe, 4,480,045, Cl. 501-153.000.
Batey, Robert M.; and Becker, James D., to Hewlett-Packard Company. Apparatus for peak detection in magnetic recording. 4,480,276, Cl. 360-46.000.
Batra, Sushil K., to Columbia Chase Corporation. Treating-high asphaltene fuel oils. 4,479,805, Cl. 44-51.000.
Battelle Development Corporation: *See*—
Kornmann, Michel; and Talmor, Yehuda, 4,479,891, Cl. 252-512.000.
Bauer, Frank R.: *See*—
Narveson, Brian C.; and Bauer, Frank R., 4,479,399, Cl. 74-339.000.
Baumann, Heinz, to Schaum-Chemie Wilhelm Bauer G.m.b.H. & Co. KG. Process for manufacturing modified amino-resin products. 4,480,055, Cl. 521-106.000.
Baumann, Marcus: *See*—
Breitenstein, Werner; Baumann, Marcus; and Bosshard, Hans, 4,480,106, Cl. 549-253.000.
Baumrucker, Ervin J., to Cashiers Plastics. Process and mold for molding foamed plastic articles. 4,479,914 Cl. 264-45.500.
Baurand, Gilles: *See*—
Barthelemy, Philippe; Baurand, Gilles; and Roussel, Francois, 4,480,194, Cl. 307-132.00E.
Bax, Anton M., to Smiths Industries Public Limited Company. Synchronous electric motor control systems. 4,480,215, Cl. 318-306.000.
Baxter Travenol Laboratories, Inc.: *See*—
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,760, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,761, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,762, Cl. 417-395.000.
Dolana, Gary H., 4,480,029, Cl. 435-5.000.
Thomas, William R., 4,479,938, Cl. 424-101.000.
Bayer AG: *See*—
Brooker, Peter J.; and Goose, John, 4,479,960, Cl. 424-270.000.
Bayer Aktiengesellschaft: *See*—
Hamprecht, Rainer, 4,479,899, Cl. 260-205.000.
Heitkamper, Peter; Fauss, Rudolf; Findeisen, Kurt; Penninger, Stefan; and Scholl, Hans-Joachim, 4,480,110, Cl. 549-467.000.
Regel, Erik, 4,480,114, Cl. 549-563.000.
Bayerische Motoren Werke AG: *See*—
Rother, Hubert, 4,479,734, Cl. 403-4.000.
Baylerian, Marguerite S.: *See*—
Knapp, Gordon G.; Baylerian, Marguerite S.; and Seemuth, Paul D., 4,479,905, Cl. 260-467.000.
BBC Brown Boveri & Company, Limited: *See*—
Blahous, Leopold; and Koppl, Georg, 4,480,193, Cl. 307-19.000.
Gessinger, Gernot; and Schroder, Gunther, 4,479,833, Cl. 148-11.50R.
Beachler, Larry A.: *See*—
Stern, Theodore J.; and Beachler, Larry A., 4,479,332, Cl. 51-277.000.
Beair, Charles E.: *See*—
Mundt, Arnold L.; and Beair, Charles E., 4,479,587, Cl. 220-89.00A.
Bean, Harley F.; and Noonan, Daniel T., to Mead Corporation, The. Paper handling system. 4,479,641, Cl. 270-53.000.
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., to Ashland Oil, Inc. High performance catalysts for carbometallic oil conversion and their manufacturing and use. 4,480,047, Cl. 502-65.000.
Becker, James D.: *See*—
Batey, Robert M.; and Becker, James D., 4,480,276, Cl. 360-46.000.
Becker, Joseph J.: *See*—
Schulte-Elte, Karl H.; Becker, Joseph J.; and Schenk, Walter, 4,480,107, Cl. 549-355.000.
Becker, Larry W., to Betz Laboratories, Inc. High calcium tolerant deposit control method. 4,479,878, Cl. 210-699.000.
Becker, Mitchell; and Sachs, Howard M., to Halcon SD Group, Inc., The. Process for the production of variable amounts of DPA and aniline using only phenol and ammonia as the feedstock. 4,480,127, Cl. 564-402.000.
Bedborough, Rodney A.: *See*—
Curley, Laurence D.; Whitehead, David A.; and Bedborough, Rodney A., 4,479,463, Cl. 123-195.00C.
Beder, Alan H.; and Lai, Nai-Chiu J., to Ingold Electrodes. Electrode assembly. 4,479,865, Cl. 204-415.000.
Beecham Group P.L.C.: *See*—
Hadley, Michael S., 4,480,099, Cl. 546-164.000.
Begga, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., to United States of America, National Aeronautics and Space Administration. Insulation bonding test system. 4,479,386, Cl. 73-582.000.
Behringwerke Aktiengesellschaft: *See*—
Sedlacek, Hans-Harald; and Seiler, Friedrich R., 4,479,934, Cl. 424-85.000.
Behrmann, William C.; and Jones, Thomas G., to Exxon Research & Engineering Co. Treatment of residual bottoms from fluorosulfuric acid regeneration. 4,479,926, Cl. 423-467.000.
Beinvogl, Willy; and Hasler, Barbara, to Siemens Aktiengesellschaft. Method for etching integrated semiconductor circuits containing double layers consisting of polysilicon and metal silicide. 4,479,850, Cl. 156-643.000.
Beise, Hans: *See*—
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.
Beistegui Chirapozu, Jose L., to B.N., S.A. Gymnastic bicycle. 4,479,646, Cl. 272-73.000.
Belbin, Geoffrey R.; and Cogswell, Frederic N., to Imperial Chemical Industries PLC. Process of producing fibre-reinforced shaped articles. 4,479,998, Cl. 428-220.000.
Beldzisky, David. Prosthesis retainer. 4,479,272, Cl. 3-16.000.
Belgard, Richard A.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Norbornyl oxyacetaldehyde, organoleptic uses thereof and process for preparing same. 4,480,136, Cl. 568-445.000.
Beloit Corporation: *See*—
Kelyman, John, Jr., 4,479,581, Cl. 209-3.000.
Beltz, Donald G.: *See*—
Whitman, Boyce D.; Beltz, Donald G.; and Reese, Morris T., 4,480,286, Cl. 361-314.000.
Bendix Corporation, The: *See*—
Marmillion, David J.; and Brush, Robert W., Sr., 4,479,689, Cl. 339-89.00M.
Bennett, Milton C., to J. I. Case Company. Float positioning assembly for pilot operated valve. 4,479,514, Cl. 137-625.630.
Benoit, Eric, to Polytronic AG. Method of determining sound propagation. 4,480,313, Cl. 364-565.000.
Benz, Willi: *See*—
Feldmann, Hugo; Illert, Karl; Benz, Willi; and Bohnenkamp, Heinrich, 4,479,374, Cl. 72-236.000.
Beretta, Pier C. Means for attaching silencers to portable firearms. 4,479,418, Cl. 89-14.00D.
Berg, Richard M., to United States of America, Army. Wide band energy absorbing camouflage blanket. 4,479,994, Cl. 428-195.000.
Berger, Abe, to M&T Chemicals Inc. Siloxane-containing polymers. 4,480,009, Cl. 428-447.000.
Bergh Bros. Co., Inc.: *See*—
Bergh, George G.; and Bergh, Robert G., 4,479,737, Cl. 403-382.000.
Bergh, George G.; and Bergh, Robert G., to Bergh Bros. Co., Inc. Positive interlock. 4,479,737, Cl. 403-382.000.

Bergh, Robert G.: *See*—
Bergh, George G.; and Bergh, Robert G., 4,479,737, Cl. 403-382.000.
Bergholz, Helmut, to Messerschmitt-Bolkow-Blohm G.m.b.H. Floor construction for the upper compartment of an aircraft. 4,479,621, Cl. 244-117.00R.
Bernard, Vincent S. Variable speed meat grinder. 4,479,614, Cl. 241-82.200.
Bernstein, David H.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Bertelsen, Corey A., to Chevron Research Company. Process and device for recovering heat from a particulate solid. 4,479,308, Cl. 34-10.000.
Bertheas, Jean: *See*—
Orieux, Francois; and Bertheas, Jean, 4,480,322, Cl. 367-123.000.
Berti, Alfredo; and Ilari, Attilio, to Snamprogetti S.p.A. Device for laying underground or digging up subsea conduits. 4,479,741, Cl. 405-163.000.
Bertolami, Salvatore: *See*—
Bertolami, Ugo; and Bertolami, Salvatore, 4,479,331, Cl. 49-404.000.
Bertolami, Ugo; and Bertolami, Salvatore, to J. B. Sash & Door Co. Inc. Vinyl clad wood construction replacement sash windows. 4,479,331, Cl. 49-404.000.
Bethlehem Steel Corporation: *See*—
Hart, Robert G.; and Townsend, Herbert E., 4,479,832, Cl. 148-6.14R.
Betz Laboratories, Inc.: *See*—
Becker, Larry W., 4,479,878, Cl. 210-699.000.
Beukers, John M.; and Williams, Christian B., to Beukers Laboratories, Inc. Radiosonde housing. 4,480,334, Cl. 455-98.000.
Beukers Laboratories, Inc.: *See*—
Beukers, John M.; and Williams, Christian B., 4,480,334, Cl. 455-98.000.
Bey, Roger. Attenuating rotating valve having varying configurations. 4,479,510, Cl. 137-625.310.
Biby, Robert. Swimming pool siphon. 4,479,274, Cl. 4-496.000.
Bilco Tools, Inc.: *See*—
Coyle, William E., Sr., 4,479,538, Cl. 166-173.000.
Billard, Alain A.; Santalucia, Andre R.; and Encoyand, Roland C., to Societe E. LaCroix. Missile launcher module in particular for aircraft, with general reversible safety device. 4,479,417, Cl. 89-1.50D.
Billotte, Keith; and Shive, Patrick, to Shive, Patrick. Heating system. 4,479,605, Cl. 237-8.00R.
Bilsbury, Stephen J., to Olin Corporation. Saboted shot. 4,479,438, Cl. 102-454.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., to Baxter Travenol Laboratories, Inc. Actuator apparatus for a prepackaged fluid processing module having pump and valve elements operable in response to applied pressures. 4,479,760, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., to Baxter Travenol Laboratories, Inc. Actuator apparatus for a prepackaged fluid processing module having pump and valve elements operable in response to externally applied pressures. 4,479,761, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., to Baxter Travenol Laboratories, Inc. Prepackaged fluid processing module having pump and valve elements operable in response to applied pressures. 4,479,762, Cl. 417-395.000.
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; and Light, Daivd N., to International Business Machines Corporation. Method for determination of concentration of organic additive in plating bath. 4,479,852, Cl. 204-1.00T.
Binzen, Willard, to Dravo Corporation. Rotary car dumper installation with integral dust collection. 4,479,749, Cl. 414-291.000.
Biomerieux: *See*—
Trouyez, Gerard, 4,480,043, Cl. 436-536.000.
Bizzini, Bernard, to Institut Pasteur. Thiolated polypeptide compound derived from a tetanus toxin fragment, the process for its obtention and its applications. 4,479,940, Cl. 424-177.000.
Bizzini, Bernard: *See*—
Metianu, Tiberius; and Bizzini, Bernard, 4,479,935, Cl. 424-92.000.
Bjorklund, Leif: *See*—
Faldt, Inge; and Bjorklund, Leif, 4,479,443, Cl. 110-346.000.
Black & Decker Inc.: *See*—
Grossmann, Horst; Meier, Rolf; and Schmid, Karl, 4,479,555, Cl. 173-171.000.
Blahous, Leopold; and Koppl, Georg, to BBC Brown Boveri & Company, Limited. Switching system. 4,480,193, Cl. 307-19.000.
Blanchet, Pierre; and Recasens, Joseph, to Societe Europeenne des Produits Refractaires. Construction of regenerator furnaces. 4,479,778, Cl. 432-180.000.
Blanco, David M. Hair removing apparatus. 4,479,311, Cl. 34-90.000.
Blasko, Gyorgy: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Blatchford, John M. A., to Blatchford, John M. A. Method of making a building panel. 4,479,916, Cl. 264-263.000.
Blatz, Richhold J., to Lyrone Kelsey Industries Ltd. Jackable prop. 4,479,634, Cl. 254-133.00R.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
Hohmann, Wolfgang, 4,479,823, Cl. 75-0.50R.
Rusing, Arnold E.; and von Schuckmann, Alfred, 4,479,592, Cl. 222-319.000.
Blomquist, Leonard A.: *See*—
Bartimes, George P.; Avery, John L.; Blomquist, Leonard A.; and McDonald, Stephen B., 4,479,644, Cl. 271-107.000.
Bloo, Johann: *See*—
Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, 4,479,517, Cl. 139-13.00R.
Boardman, Simon M.: *See*—
Prabhu, Ashok N.; and Boardman, Simon M., 4,479,890, Cl. 252-508.000.
BOC Group plc, The: *See*—
Gibson, Peter H.; and Taylor, Robert I., 4,479,363, Cl. 62-63.000.
Bocckino, Harry G.; and Meyer, Jon P., to Texasgulf, Inc. Centrifugal separator and method of operating same. 4,479,790, Cl. 494-85.000.
Bock, Mark G.: *See*—
Veber, Daniel F.; Boger, Joshua S.; and Bock, Mark G., 4,479,941, Cl. 424-177.000.
Boden, Richard M.: *See*—
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,480,136, Cl. 568-445.000.
Bodor, Nicholas S., to University of Florida. Brain-specific drug delivery. 4,479,932, Cl. 424-9.000.
Boehringer Mannheim GmbH: *See*—
Wiedemann, Fritz; Michel, Helmut; Weckerle, Wolfgang; Roesch, Egon; and Strein, Klaus, 4,479,962, Cl. 424-273.00N.
Boeing Company, The: *See*—
Maraghe, Alex; and Opsahl, Allan W., 4,479,623, Cl. 244-129.500.
Rogers, John T.; and Manning, Kenneth J. R., 4,479,620, Cl. 244-75.00R.
Spencer, Donald B.; and Fitch, John L., 4,480,254, Cl. 343-708.000.
Wren, Lloyd W., 4,480,256, Cl. 343-909.000.
Boettcher, Ralph A., to Unitek Corporation. Method for facilitating the manufacture of a bondable metallic surface. 4,479,527, Cl. 164-34.000.
Boger, Joshua S.: *See*—
Veber, Daniel F.; Boger, Joshua S.; and Bock, Mark G., 4,479,941, Cl. 424-177.000.
Bohnenkamp, Heinrich: *See*—
Feldmann, Hugo; Illert, Karl; Benz, Willi; and Bohnenkamp, Heinrich, 4,479,374, Cl. 72-236.000.
Bolesky, Richard C.; Farling, Gene M.; and Gold, Barry L., to Zimmer, Inc. Prosthetic device adapted to promote bone/tissue ingrowth. 4,479,271, Cl. 3-1.911.
Bolte, Richard. Wind driven rotatable reflector for vehicles. 4,479,699, Cl. 350-99.000.
Bonassi, Luciano. Roller fair-sheet for boat sails manenvering. 4,479,453, Cl. 114-218.000.
Bonnard, Pierre, to Etablissements LE SIMPLEX. Speed gear device at the crank-wheel of bicycles and similar vehicles. 4,479,787, Cl. 474-82.000.
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, to Corning Glass Works. Infrared polarizing glasses. 4,479,819, Cl. 65-30.110.
Borg-Warner Chemicals, Inc.: *See*—
Halpern, Yuval; and Mott, Donna M., 4,480,093, Cl. 544-195.000.
Borg-Warner Corporation: *See*—
Meixner, Edwin J., 4,479,390, Cl. 73-862.360.
Bosscher, Filippus; Penfold, John; Reich, Klaus W.; and Zandvoort, Albertus, to Upjohn Company, The. Compositions and process. 4,480,070, Cl. 524-591.000.
Bosshard, Hans: *See*—
Breitenstein, Werner; Baumann, Marcus; and Bosshard, Hans, 4,480,106, Cl. 549-253.000.
Bota r, Sa ndor: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Bottomley, Paul A., to General Electric Company. Selective volume method for performing localized NMR spectroscopy. 4,480,228, Cl. 324-309.000.
Bourbon, Jean: *See*—
Eichner, Falk J.; Ramsdale, Douglas S.; and Bourbon, Jean, 4,479,577, Cl. 206-45.180.
Bournonville, Jean-Paul; and Miquel, Jean, to Societe Francaise des Produits Pour Catalyse Pro-Catalyse chez Institute Francais Du Petrole. Catalysts for hydrocarbons conversion. 4,480,048, Cl. 502-227.000.
Bowers, John E.: *See*—
Newton, Steven A.; Bowers, John E.; and Shaw, Herbert J., 4,479,701, Cl. 350-96.160.
Boyadjieff, George I.; and Campbell, Andrew B., to Varco International, Inc. Well pipe jack. 4,479,547, Cl. 166-383.000.
Boyer, William J.: *See*—
Umbach, Newell L.; and Boyer, William J., 4,479,612, Cl. 239-280.000.
Brasky, Joseph L. Directional electrical heating panel assembly. 4,480,175, Cl. 219-345.000.
Bratt, Richard G.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.;

Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.

Bravenec, Frank R., to Halliburton Company. Borehole apparatus for thermal equalization. 4,479,383, Cl. 73-151.000.

Breed, William F., to George E. Failing Company. Reinforced valve member. 4,479,508, Cl. 137-516.250.

Brehmer, Kevin E.; Wieser, James B.; and Laber, Carlos A., to National Semiconductor Corporation. Large swing CMOS power amplifier. 4,480,230, Cl. 330-255.000.

Breitenstein, Werner; Baumann, Marcus; and Bosshard, Hans, to Ciba-Geigy Corporation. Process for the preparation of asymmetrically substituted maleic anhydrides, and asymmetrically substituted maleic anhydrides. 4,480,106, Cl. 549-253.000.

Brennan, James A.; Lucki, Stanley J.; and Schoennagel, Hans J., to Mobil Oil Corporation. Catalysts for the conversion of methanol to ethylene plus gasoline. 4,480,145, Cl. 585-640.000.

Brennan, John F., to UOP Inc. Exhaust gas oxidation catalyst. 4,480,050, Cl. 502-330.000.

Brent, Albert: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,479,810, Cl. 48-86.00R.

Bresie, Don A.; Burns, Jack M.; and Fowler, Donald W. Method and apparatus for producing natural gas from tight formations. 4,479,546, Cl. 166-369.000.

Brewer, Richard J., to Eastman Kodak Company. Process for preparing cellulose sulfate esters. 4,480,091, Cl. 536-59.000.

Briggs, Peter J.; and Brooks, Kenneth J., to Matburn (Holdings) Limited. Surgical drainage bags. 4,479,818, Cl. 55-385.00C.

Brigham Young University: *See*—
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., 4,479,380, Cl. 73-61.10C.

Brignola, Dominic J.; Brown, Homer J.; Sutryn, Caroll S.; and Walters, Ralph, to West Company, The. Single barrel two-compartment medicament container assembly. 4,479,578, Cl. 206-221.000.

Brigodiot, Maryvonne: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Dawans, Francois; Marechal, Ernest; and Brigodiot, Maryvonne, 4,480,011, Cl. 428-474.400.

Brill, William F., to Halcon SD Group, Inc., The. Epoxidation catalyst and process. 4,480,113, Cl. 549-531.000.

British Aerospace Public Limited Company: *See*—
Howse, Eric R. W., 4,479,622, Cl. 244-129.500.

Brock, George W.; and Conner, Alfred W., to Verbatim Corporation. Stabilized locating ring for a flexible disk. 4,480,282, Cl. 360-135.000.

Bronswerk K.A.B. B.V.: *See*—
Lameris, Herman J., 4,479,536, Cl. 165-145.000.

Brooker, Peter J.; and Goose, John, to Bayer AG. Anthelminthic pour-on veterinary composition. 4,479,960, Cl. 424-270.000.

Brooks, Kenneth J.: *See*—
Briggs, Peter J.; and Brooks, Kenneth J., 4,479,818, Cl. 55-385.00C.

Browatzki, Kurt: *See*—
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,479,987, Cl. 427-402.000.

Brown, Homer J.: *See*—
Brignola, Dominic J.; Brown, Homer J.; Sutryn, Caroll S.; and Walters, Ralph, 4,479,578, Cl. 206-221.000.

Brown, Jack E., Jr.: *See*—
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.

Brown, Richard I.: *See*—
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,760, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,761, Cl. 417-395.000.
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,762, Cl. 417-395.000.

Brown, Robert J. S., to Chevron Research Company. Portable pulsed NMR instrument and method of use. 4,480,227, Cl. 324-303.000.

Brown, Roger S.; Shepard, Charles L.; and Richard, Laurey J., to United States of America, Agriculture. Apparatus to extract fine trash and dust during high-velocity discharging of cotton from opener cleaner. 4,479,286, Cl. 19-200.000.

Brown, William F.: *See*—
Christiansen, David W.; and Brown, William F., 4,480,171, Cl. 219-136.000.

Brown, William T.; and Simons, Robert M., to Eastman Kodak Company. Process for the preparation of $\alpha,\beta$-unsaturated ketones. 4,480,132, Cl. 568-42.000.

Brownscombe, Thomas F., to Shell Oil Company. Thin layer thermoplastic polymer bonded covalently at its surface to a mineral component. 4,480,005, Cl. 428-336.000.

Bruce, John C., to Gulf Canada Limited. Mobile bottom-founded caisson for arctic operations. 4,479,742, Cl. 405-217.000.

Bruggemann, Reinhold: *See*—
Grundken, Dieter; Bruggemann, Reinhold; Linke, Horst; and Redder, Manfred, 4,479,575, Cl. 198-735.000.

Brugger, Franz: *See*—
Burckhardt, Manfred; Paul, Jurgen; and Brugger, Franz, 4,480,309, Cl. 364-426.000.

Bruhmann, Werner: *See*—
Djordjevic, Ilija; Bruhmann, Werner; Ritter, Ernst; and Frey, Hansjorg, 4,479,474, Cl. 123-373.000.

Brunninger, Manfred: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,479,439, Cl. 104-7.00R.

Brush, Robert W., Sr.: *See*—
Marmillion, David J.; and Brush, Robert W., Sr., 4,479,689, Cl. 339-89.00M.

BS&B Safety Systems, Inc.: *See*—
Finnegan, Michael C., 4,479,603, Cl. 228-155.000.
Mundt, Arnold L.; and Beair, Charles E., 4,479,587, Cl. 220-89.00A.

Buckley, Alan; and McMahon, Paul E., to Celanese Corporation. Fabric comprised of fusible and infusible fibers, the former comprising a polymer which is capable of forming an anisotropic melt phase. 4,479,999, Cl. 428-245.000.

Budde, David L.; Carson, David G.; Johnson, David B.; and Wilde, Doran K., to Intel Corporation. Interface for use between a memory and components of a module switching apparatus. 4,480,307, Cl. 364-200.000.

Buddy L Corporation: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,479,326, Cl. 446-23.000.

Buenger, Paul: *See*—
Thoma, Martin; and Buenger, Paul, 4,479,355, Cl. 204-16.000.

Buick, James M., to Ferranti Limited. Explosive mine. 4,479,437, Cl. 102-411.000.

Buller, J. Stanley, to Santa Barbara Research Center. Thermal filter. 4,479,367, Cl. 62-514.00R.

Bullock, Ralph, to Eggan, Bernadine A.; and Mize, David L. Fiber board composition. 4,479,912, Cl. 264-23.000.

Bundschuh, Robert L. Pump dispenser with adjustable nozzle. 4,479,593, Cl. 222-321.000.

Bung, Richard; Giesbrecht, Hartmut; Leuckel, Wolfgang; and Klimisch, Hans-Joachim, to BASF Aktiengesellschaft. Inhalation apparatus for test animals. 4,479,493, Cl. 128-204.180.

Buonavita, Carlos E., to International Telephone and Telegraph Corporation. Gas detector. 4,480,252, Cl. 340-632.000.

Buonomo, Franco: *See*—
Esposito, Antonio; Neri, Carlo; and Buonomo, Franco, 4,480,135, Cl. 568-385.000.

Burckhardt, Manfred; Paul, Jurgen; and Brugger, Franz, to Daimler-Benz Aktiengesellschaft. Drive control device for a motor vehicle which is also equipped with an anti-blocking system. 4,480,309, Cl. 364-426.000.

Bure, Jacques: *See*—
Regnier, Gilbert; and Bure, Jacques, 4,479,952, Cl. 424-250.000.

Burger, Bernd: *See*—
Herold, Wolf-Dietrich; Grimm-Lenz, Rainer; and Burger, Bernd, 4,479,781, Cl. 433-90.000.

Burk, Werner: *See*—
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.

Burkhart, George M.; White, Joseph M.; and Witkonis, Diane M., to Barber-Greene Company. Apparatus and method for removing foreign materials from a cement metering wheel. 4,479,591, Cl. 222-317.000.

Burlington Industries, Inc.: *See*—
Wang, Kenneth Y., 4,479,370, Cl. 68-22.00R.

Burns, Jack M.: *See*—
Bresie, Don A.; Burns, Jack M.; and Fowler, Donald W., 4,479,546, Cl. 166-369.000.

Burough, Irvin G.; and Williams, Kevin G., to Andros Analyzers Incorporated. Non-dispersive infrared gas analyzer. 4,480,190, Cl. 250-343.000.

Burr, Martin A.; Conroy, Brian G.; and Spencer, Maurice, to Pandrol Limited. Rail clip driving apparatus. 4,479,440, Cl. 104-17.00A.

Burr, Roland E. Oscillating trolling lure. 4,479,323, Cl. 43-42.500.

Burroughs Corporation: *See*—
Ely, Richard I.; and Mosier, Carl E., 4,480,182, Cl. 250-227.000.
Ely, Richard I.; and Subbarao, Wunnava V., 4,480,183, Cl. 250-227.000.
Ely, Richard I., 4,480,184, Cl. 250-227.000.
Sandow, Peter M.; and Chin, Barry L., 4,479,831, Cl. 148-1.500.

Burrows, Thomas W.; and Cavil, David T., to Outboard Marine Corporation. Multiple spark CD ignition system. 4,479,467, Cl. 123-606.000.

Bushey, Dean F.: *See*—
Hodakowski, Leonard E.; and Bushey, Dean F., 4,479,946, Cl. 424-200.000.

Bussmann, Heinrich: *See*—
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Butler, David V.: *See*—
Orlowski, Jan A.; and Butler, David V., 4,479,782, Cl. 433-220.000.

Butt, Sheldon H., to Olin Corporation. Semiconductor casing. 4,480,262, Cl. 357-74.000.

Butterfield, Brian J., to Metal Spinners (Ireland) Limited. Water heater. 4,480,173, Cl. 219-312.000.

Buyanov, Valentin M.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.

Byerley, Thomas J.: *See*—
Chappelow, Cecil C., Jr.; and Byerley, Thomas J., 4,479,552, Cl. 173-139.000.

Caffarel, Alfred J.: *See*—
Nance, Roy A.; Hartley, William H.; and Caffarel, Alfred J., 4,480,225, Cl. 324-238.000.
California Institute of Technology: *See*—
McCaldin, James O.; and Kuech, Thomas F., 4,479,847, Cl. 156-624.000.
Calihan, Rudy B.; Goad, Bobby F.; and Miller, Gary A., to Baker Oil Tools, Inc. Pressure actuated pack-off and method. 4,479,544, Cl. 166-290.000.
Campbell, Andrew B.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,479,547, Cl. 166-383.000.
Campbell, Arthur R.: *See*—
Kutnyak, Thomas A.; and Campbell, Arthur R., 4,479,835, Cl. 156-143.000.
Campbell, Hugh L., to Dravo Corporation. Pokehole system for fixed bed gasifier and pokehole unit. 4,479,808, Cl. 48-76.000.
Canadian Mountaineering Equipment Ltd.: *See*—
Opsal, Roy T., 4,479,595, Cl. 224-211.000.
Canadian Patents & Development Limited: *See*—
Cielo, Paolo G.; and Dallaire, Serge, 4,480,168, Cl. 219-121.00L.
McLean, Paul D.; Garton, Andrew; Scott, Robert F.; and Gransden, Susan E., 4,480,082, Cl. 528-103.000.
Cannady, Daniel L., Jr.; and Mungin, Halbert, to Westinghouse Electric Corp. Antistatic laminates containing metal salts. 4,480,001, Cl. 428-284.000.
Canon Kabushiki Kaisha: *See*—
Fujiki, Makoto; and Takayama, Makoto, 4,480,273, Cl. 360-19.100.
Hara, Teruya; and Ina, Kenzo, 4,480,277, Cl. 360-69.000.
Kinchi, Masayoshi; and Sakurada, Nobuaki, 4,479,707, Cl. 354-426.000.
Kosugi, Masao; Sato, Hiroshi; Takahashi, Kazuo; Ishiyama, Ichiro; and Yabu, Shuichi, 4,479,711, Cl. 355-43.000.
Maeda, Masaya, 4,480,278, Cl. 360-73.000.
Masunaga, Makoto, 4,479,704, Cl. 354-137.000.
Tamamura, Hideo; Matsuda, Mutsuhide; Suzuki, Toyotosi; and Endo, Takashi, 4,479,705, Cl. 354-173.100.
Tokuda, Ryuji, 4,479,708, Cl. 354-427.000.
Cantwell, Gill. System for mounting magnetic transducer means on opposite sides of a flexible rotating magnetic disc. 4,480,281, Cl. 360-104.000.
Carboni, Alberto. Lamp that can be thrown. 4,480,294, Cl. 362-184.000.
Carey, Joseph E., Jr.: *See*—
Guide, John J.; Carey, Joseph E., Jr.; Eichamer, Paul D.; Claypole, George; and Yenetchi, George V., 4,479,355, Cl. 60-683.000.
Carlson, Robert E.; and Skilton, Halsey W., to A. H. Nilson Machine Co., Inc., The. Vertical fourslide metal forming machine. 4,479,376, Cl. 72-455.000.
Carothers, Charles H.; Garau, John E.; and Basa, Thomas P., to Westinghouse Electric Corp. Electric cutout. 4,480,245, Cl. 337-180.000.
Carr, Clarence A.; Huddleston, Robert L.; and Strickland, Jimmy P., to International Business Machines Corporation. Method and means for the retention of locks across system, subsystem, and communication failures in a multiprocessing, multiprogramming, shared data environment. 4,480,304, Cl. 364-200.000.
Carrier Corporation: *See*—
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Carroll, William L., to NCC Engineering, Inc. Juicer for separating pulp and juice from fruit. 4,479,424, Cl. 99-502.000.
Carruthers, James D.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,480,047, Cl. 502-65.000.
Carson, David G.: *See*—
Budde, David L.; Carson, David G.; Johnson, David B.; and Wilde, Doran K., 4,480,307, Cl. 364-200.000.
Carter, James L.: *See*—
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Cashiers Plastics: *See*—
Baumrucker, Ervin J., 4,479,914, Cl. 264-45.500.
Casio Computer Co., Ltd.: *See*—
Ishibashi, Masanori, 4,479,411, Cl. 84-1.010.
Cassata, John R.: *See*—
Shires, Philip J.; Cassata, John R.; Mandelik, Bernard G.; and van Dijk, Christiaan P., 4,479,925, Cl. 423-359.000.
Castonguay, Roger N.; and Jencks, Charles L., to General Electric Company. Variable torque contact arm for electric circuit breakers. 4,480,242, Cl. 335-194.000.
Cavil, David T.: *See*—
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Celanese Corporation: *See*—
Buckley, Alan; and McMahon, Paul E., 4,479,999, Cl. 428-245.000.
Hackman, E. B.; and Zeagler, L. D., 4,480,138, Cl. 568-454.000.
Horlenko, Theodore; and Aguilo, Adolfo, 4,480,122, Cl. 560-239.000.
Hsieh, Jih-Han, 4,480,034, Cl. 435-136.000.
McGinnis, James L., 4,480,115, Cl. 560-1.000.
Natarajan, Kavilipalayam; and Zimmerman, Daniel, 4,480,071, Cl. 524-593.000.
Celotex Corporation, The: *See*—
Kroh, Carl A., 4,479,339, Cl. 52-468.000.
Central Soya Company, Inc.: *See*—
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Centre National du Machinisme Agricole, du Genie Rural, des Eaux et des Forets (CEMAGREF): *See*—
Arbeille, Yves; and Lucas, Jean, 4,479,908, Cl. 261-62.000.
Chan, Siu-Kee: *See*—
Thompson, Daniel G.; and Chan, Siu-Kee, 4,479,735, Cl. 403-28.000.
Chandler, Noel. Automatic electrical bed knife adjuster. 4,479,346, Cl. 56-250.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Hydrocarbon synthesis. 4,480,143, Cl. 585-469.000.
Chang, Hao J.; Popp, Gerhard; and Saturno, Patrick H., to Eastman Kodak Company. Water reservoir layers in bleach-fix sheets. 4,480,025, Cl. 430-206.000.
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Klessing, Klaus; and Chatterjee, Shyam S., 4,479,951, Cl. 424-248.570.
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Theodore, Ares N.; and Chattha, Mohinder S., 4,480,069, Cl. 524-504.000.
Chemiefaser Lenzing Aktiengesellschaft: *See*—
Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, 4,479,517, Cl. 139-13.00R.
Chen, Catherine S. H.; and Luh, Yuhshi, to Mobil Oil Corporation. Oil recovery by surfactant-alcohol waterflooding. 4,479,894, Cl. 252-8.55D.
Chen, Li F.; and Seethanathan, Parakkat, to Purdue Research Foundation. Modified cellulose products by bleaching. 4,480,089, Cl. 536-56.000.
Chen, Nai Y.; and Walsh, Dennis E., to Mobil Oil Corporation. Fixed sulfur petroleum coke fuel and method for its production. 4,479,804, Cl. 44-1.0SR.
Chen, Robert H. K.: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,479,964, Cl. 424-278.000.
Cheng, Yih-Shyun E., to Du Pont de Nemours, E. I., and Company. Density separation of protein overproducing bacteria. 4,480,038, Cl. 435-261.000.
Cherington, Floyd E., to Lennox Industries, Inc. Drain leg assembly. 4,479,482, Cl. 126-99.00R.
Chern, Horng Y. Cassette type hygienic comb and brush. 4,479,501, Cl. 132-85.000.
Chester, Martin H. Injecting needle with inclinometer. 4,479,800, Cl. 604-187.000.
Chetty, P. R. K.; and Fair, Donald G., to Sundstrand Corporation. Synchronizing circuit for push-pull inverter. 4,480,297, Cl. 363-26.000.
Chevron Research Company: *See*—
Bertelsen, Corey A., 4,479,308, Cl. 34-10.000.
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Luo, Tatao, 4,479,900, Cl. 260-239.00A.
Child, Edward T.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,479,810, Cl. 48-86.00R.
Chin, Albert K.: *See*—
Fogarty, Thomas J.; and Chin, Albert K., 4,479,497, Cl. 128-344.000.
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Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Chissov, Valery I.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.
Chong, Fu C., to Fairchild Camera & Instrument Corp. Method of programming of junction-programmable read-only memories. 4,480,318, Cl. 365-104.000.
Chopra, Kuldip S.; Ealer, George E.; and Salensky, George A., to Elkem Metals Company. Color pigment for use in the production of thermoplastic articles. 4,480,064, Cl. 524-413.000.
Christensen, Burton G., to Merck & Co., Inc. Oral absorption enhancement of carboxylic acid pharmaceuticals using (5-alkyl-2-oxo-1,3-dioxolen-4-yl)methyl ester group. 4,479,947, Cl. 424-203.000.
Christiansen, David W.; and Brown, William F., to United States of America, Energy. Gas tungsten arc welder with electrode grinder. 4,480,171, Cl. 219-136.000.
Christophorou, Loucas G.: *See*—
Adcock, James L.; Pace, Marshall O.; and Christophorou, Loucas G., 4,480,147, Cl. 174-14.00R.
Chugai Denki Kogyo K.K.: *See*—
Shibata, Akira, 4,479,892, Cl. 252-514.000.

Chung, Kuo-Ing: *See*—
Wong, Joseph S.; Chung, Kuo-Ing; and Rudenauer, Kenneth A., 4,480,336, Cl. 455-328.000.
Ciba-Geigy AG: *See*—
Postle, Stephen R.; and Thomas, Patrick D. P., 4,480,104, Cl. 549-71.000.
Ciba-Geigy Corporation: *See*—
Breitenstein, Werner; Baumann, Marcus; and Bosshard, Hans, 4,480,106, Cl. 549-253.000.
Fischer, Walter; Kvita, Vratislav; and Zweifel, Hans, 4,480,105, Cl. 549-243.000.
Fletcher, Ian J., 4,480,096, Cl. 544-289.000.
Gruenfeld, Norbert, 4,479,963, Cl. 424-274.000.
Meyer, Willy; and Fory, Werner, 4,479,821, Cl. 71-93.000.
Meyer, Willy, 4,480,101, Cl. 544-320.000.
Wilhelm, Max, 4,479,967, Cl. 424-313.000.
Yokoyama, Naokata, 4,479,955, Cl. 424-251.000.
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Rampf, Rudolf; and Sollner, Erich, 4,480,006, Cl. 428-343.000.
Ciciliot, Henry; and Relf, David J. Electric heat exchanger for simultaneously vaporizing two different fluids. 4,480,172, Cl. 219-305.000.
Cielo, Paolo G.; and Dallaire, Serge, to Canadian Patents & Development Limited. Laser-surface coupler. 4,480,168, Cl. 219-121.00L.
Citizen Watch Co., Ltd.: *See*—
Koide, Hiroshi; and Sawada, Toshiaki, 4,479,725, Cl. 368-292.000.
Matsumoto, Masataka; and Murata, Toshio, 4,479,724, Cl. 368-291.000.
Nakajima, Fumio, 4,480,216, Cl. 318-331.000.
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, 4,480,010, Cl. 428-457.000.
Clague, Kevin L. Apparatus and method for transcribing music. 4,479,416, Cl. 84-462.000.
Clancy, Gerald F.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Clarion Co., Ltd.: *See*—
Okamoto, Takeshi; Asai, Ryuichi; and Minagawa, Shoichi, 4,480,209, Cl. 310-313.00B.
Clarke, Terence A.; Edwards, Richard B.; and Irving, Gracme N., to Lever Brothers Company. Detergent bar processing. 4,479,884, Cl. 252-132.000.
Claypole, George: *See*—
Guide, John J.; Carey, Joseph E., Jr.; Eichamer, Paul D.; Claypole, George; and Yenetchi, George V., 4,479,355, Cl. 60-683.000.
Clonce, Ambrose J.; Palmer, Michael; and Gott, Samuel L., to Eastman Kodak Company. Process inhibitor for readily polymerizable acrylate monomer. 4,480,116, Cl. 560-4.000.
Closmann, Philip J.; and Wortham, James T., to Shell Oil Company. Heavy oil sample preparation. 4,480,039, Cl. 436-175.000.
Cobb, Raymond L., to Phillips Petroleum Company. Catalytic alkylation. 4,480,142, Cl. 585-465.000.
Coca-Cola Company, The: *See*—
Holben, Clair D., 4,479,520, Cl. 141-1.000.
Cocain, Harry W.: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,480,076, Cl. 525-261.000.
Codel International Ltd.: *See*—
Edwards, Desmond F., 4,479,344, Cl. 53-390.000.
Cogswell, Frederic N.: *See*—
Belbin, Geoffrey R.; and Cogswell, Frederic N., 4,479,998, Cl. 428-220.000.
Cohen, Milton J. Fluid dispensing device. 4,479,801, Cl. 604-238.000.
Cole, Frank X.: *See*—
Myles, Arthur; Law, Say-Jong; and Cole, Frank X., 4,480,041, Cl. 436-508.000.
Coleman, Archie D.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.
Coleman, Charles H., Jr., to Ampex Corporation. Dropped sample data rate reduction system. 4,480,271, Cl. 358-310.000.
Coleman, Charles H., Jr., to Ampex Corporation. Record verify and optimize system. 4,480,274, Cl. 360-31.000.
Collaborative Research, Inc.: *See*—
Myles, Arthur; Law, Say-Jong; and Cole, Frank X., 4,480,041, Cl. 436-508.000.
Collins, Michael H., to Shell Internationale Research Maatschappij B. V. Means for sealing a gap around a conductor pipe in an offshore oil platform. 4,479,656, Cl. 277-135.000.
Collins, William H.: *See*—
DiPaola, Vincent J.; Collins, William H.; and Sherman, Louis M., 4,479,889, Cl. 252-365.000.
Colombo, Angelo, to Valli & Colombo S.p.A. Tubular door lock with a catch device. 4,479,671, Cl. 292-169.140.
Columbia Chase Corporation: *See*—
Batra, Sushil K., 4,479,805, Cl. 44-51.000.
Colvette, Douglas: *See*—
McIntire, Ray G.; and Colvette, Douglas, 4,479,632, Cl. 254-3.00B.
Cominco Ltd.: *See*—
Honey, Ronald N.; Manwell, Robert E.; Krauss, Clifford J.; and Ybema, Douwe, 4,479,863, Cl. 204-279.000.
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.
Compagnie Industrielle des Lasers Cilas Alcatel: *See*—
Cornillault, Jean, 4,479,717, Cl. 356-375.000.
Conmaco, Inc.: *See*—
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Conner, Alfred W.: *See*—
Brock, George W.; and Conner, Alfred W., 4,480,282, Cl. 360-135.000.
Conrad, James R. Positioning and firing device for explosive-actuated tools. 4,479,599, Cl. 227-9.000.
Conroy, Brian G.: *See*—
Burr, Martin A.; Conroy, Brian G.; and Spencer, Maurice, 4,479,440, Cl. 104-17.00A.
Constanti, Jean; and Grandadam, Pierre, to Les Condensateurs Sic Safco. Electrolytic capacitor including a composite separator between the anode and the cathode thereof. 4,480,290, Cl. 361-433.000.
Continental Conveyor & Equipment Co., Inc.: *See*—
Ragan, Eddie D., 4,479,285, Cl. 19-64.500.
Continental Plastic Containers, Inc.: *See*—
Bartimes, George F.; Avery, John L.; Blomquist, Leonard A.; and McDonald, Stephen B., 4,479,644, Cl. 271-107.000.
Cooper Industries, Inc.: *See*—
Edwards, Richard L., 4,479,617, Cl. 242-107.000.
Coppola, Frank: *See*—
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, 4,479,819, Cl. 65-30.110.
Cordis Corporation: *See*—
Tucci, Charles A., 4,479,489, Cl. 128-419.00P.
Cornelius, Edward B.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,480,047, Cl. 502-65.000.
Cornell, Paul A.: *See*—
Cornell, Paul V.; and Cornell, Paul A., 4,479,694, Cl. 339-266.00R.
Cornell, Paul V.; and Cornell, Paul A., to Pan Electric Corporation. Cable clamping device. 4,479,694, Cl. 339-266.00R.
Cornillault, Jean, to Compagnie Industrielle des Lasers Cilas Alcatel. Apparatus for measuring the position of an object. 4,479,717, Cl. 356-375.000.
Corning Glass Works: *See*—
Allaire, Roger A.; Socha, Louis S., Jr.; and Van Dewoestine, Robert V., 4,479,921, Cl. 422-180.000.
Bakal, Abraham I.; and Crossman, Tommy L., 4,479,969, Cl. 426-3.000.
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, 4,479,819, Cl. 65-30.110.
Hoda, Syed N.; and Olszewski, Anthony R., 4,480,060, Cl. 523-466.000.
McAlinn, Patrick, 4,480,044, Cl. 501-4.000.
Weetall, Howard H., 4,479,970, Cl. 426-253.000.
Cosby, Thomas. Limited expansion vapor cycle. 4,479,354, Cl. 60-670.000.
Coughlin, Michael C.; and Schenck, Timothy T., to Du Pont de Nemours, E. I., and Company. Wood-like articles made from cellulosic filler loaded ethylene interpolymers. 4,480,061, Cl. 524-13.000.
Coughlin, Stanley J.: *See*—
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Cowan, Donald A.: *See*—
Morgan, Hugh W.; Daniel, Roy M.; Cowan, Donald A.; and Hickey, Christopher W., 4,480,036, Cl. 435-220.000.
Coyle, William E., Sr., to Bilco Tools, Inc. Casing scraper and method for making the same. 4,479,538, Cl. 166-173.000.
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., to Du Pont de Nemours, E. I., and Company. Covalently bonded high refractive index particle reagents and their use in light scattering immunoassays. 4,480,042, Cl. 436-533.000.
Cramer Inc.: *See*—
Wehner, Robert L., 4,479,627, Cl. 248-406.200.
Crossman, Tommy L.: *See*—
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Crouch, William B.: *See*—
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Crowley, H. W.: *See*—
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Crowley, Michael S., to Standard Oil Company (Indiana). Refractory anchor. 4,479,337, Cl. 52-378.000.
Csaszar, Ernest J., to General Kap Corporation. Tamper-evident container with drop down skirt. 4,479,586, Cl. 215-258.000.
Cselt - Centro Studi E Laboratori Telecomunicazioni S.p.A.: *See*—
Alaria, Gian B.; and Preti, Roberto, 4,480,328, Cl. 370-63.000.
Cullinan, George J.; and Gerzon, Koert, to Eli Lilly and Company. Use of vindesine in treating acute lymphatic leukemia and other susceptible neoplasms. 4,479,957, Cl. 424-262.000.
Curley, Laurence D.; Whitehead, David A.; and Bedborough, Rodney A., to Perkins Engine Group Limited. Engine sump. 4,479,463, Cl. 123-195.00C.
Cutter Laboratories, Inc.: *See*—
Mahal, Mohan S., 4,479,989, Cl. 428-35.000.

Dai-Ichi High Frequency Co., Ltd.: *See*—
Watanabe, Yasuo, 4,479,372, Cl. 72-128.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Suzuki, Norimoto; and Hayakawa, Fukuichiro, 4,479,995, Cl. 428-203.000.
Takeuchi, Hideo; Horiguchi, Satoru; and Mizuno, Kenichi, 4,479,435, Cl. 101-382.0MV.
Daidotokushuko Kabushikikaisha: *See*—
Echigo, Ryozo; Noda, Takaaki; Kinto, Koichiro; and Sato, Kenjiro, 4,479,535, Cl. 165-142.000.
Daikin Kogyo Co., Ltd.: *See*—
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,480,103, Cl. 548-365.000.
Daimler-Benz Aktiengesellschaft: *See*—
Burckhardt, Manfred; Paul, Jurgen; and Brugger, Franz, 4,480,309, Cl. 364-426.000.
Dainippin InK and Chemicals, Inc.: *See*—
Takatsu, Haruyoshi; and Sato, Hisato, 4,480,117, Cl. 560-1.000.
Dallaire, Serge: *See*—
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Dana Corporation: *See*—
Kummer, Martin E.; Sink, William H.; and Tarlton, James K., 4,479,569, Cl. 192-70.200.
Daniel, Roy M.: *See*—
Morgan, Hugh W.; Daniel, Roy M.; Cowan, Donald A.; and Hickey, Christopher W., 4,480,036, Cl. 435-220.000.
Darr, Richard C.: *See*—
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,770, Cl. 425-503.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,771, Cl. 425-503.000.
Dashiell, Gregory L.; and Prosise, William E., to Central Soya Company, Inc. Method of preparing heat resistant lecithin release agent. 4,479,977, Cl. 426-609.000.
Data General Corporation: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Dauplaise, David L., to American Cyanamid Company. Process for the preparation of N-allyl-O-alkyl thionocarbamates. 4,479,903, Cl. 260-455.00A.
David, Allan P.: *See*—
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; and Light, Daivd N., 4,479,852, Cl. 204-1.00T.
Davidson, Allen L., to Motorola Inc. Method for achieving high isolation between antenna arrays. 4,480,255, Cl. 343-844.000.
Davis, Frank J.: *See*—
Greenway, Donald O.; and Davis, Frank J., 4,479,466, Cl. 123-527.000.
Davis, James A.; and Koch, Robert C., to Firestone Tire & Rubber Company, The. Rubber compositions and articles thereof having improved metal adhesion and metal adhesion retention. 4,480,066, Cl. 524-439.000.
Davis, Robert E., to Arkansas Patents, Inc. Pulsing combustion. 4,479,484, Cl. 126-362.000.
Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., to Federal Paper Board Company, Inc. Sealed carton with tamper indicating means. 4,479,588, Cl. 220-416.000.
Davydov, Anatoly B.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.
Dawans, Francois: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Dawans, Francois; Marechal, Ernest; and Brigodiot, Maryvonne, 4,480,011, Cl. 428-474.400.
Dawson, Charles D., to Reddiplex Limited. Spacer bar for double glazing. 4,479,988, Cl. 428-34.000.
Day, Richard M., to United States of America, National Aeronautics and Space Administration. Portable pallet weighing apparatus. 4,479,560, Cl. 177-147.000.
Dear, Terrence A.; and Hughes, Allan B., to Du Pont de Nemours, E. I., and Company. Fluid control apparatus. 4,479,509, Cl. 137-560.000.
de Bellis, Laurent; and Prokopp, Raymond, to Societe Anonyme dite SAFT. Sealed feed-through for a wall in an alkaline battery. 4,480,018, Cl. 429-160.000.
De Bisschop, James G., to Torrington Company, The. Shaft assembly. 4,479,786, Cl. 464-89.000.
Deborde, Albert H.; and Guallo, Max, to Saurer Diederichs (Societe Anonyme). Weft brake for shuttleless loom. 4,479,519, Cl. 139-450.000.
Dedo, Richard G. Cast padding. 4,479,490, Cl. 128-89.00R.
Deep Seven Co.: *See*—
Awalt, Thomas Y., Jr., 4,479,452, Cl. 114-210.000.
Defour, Paule; and Dumas, Antoine, to Angenieux CLB S. A.; and Ateliers De La Rive. Method and means for assembling the parts of cycle frames and the like. 4,479,662, Cl. 280-281.00R.
Degen, Ludwig: *See*—
Robertiello, Andrea; Angelini, Leonello; and Degen, Ludwig, 4,479,978, Cl. 426-636.000.
Degussa Akteingesellschaft: *See*—
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de Haan, Friedrich J., administrator: *See*—
Van Kessel, Theodorus J.; Franssen, Nico V., deceased; and de Haan, Friedrich J., administrator, 4,480,229, Cl. 330-84.000.
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Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.
Derkach, Galina M.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.
DeSoto, Inc.: *See*—
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Development Finance Corporation: *See*—
Morgan, Hugh W.; Daniel, Roy M.; Cowan, Donald A.; and Hickey, Christopher W., 4,480,036, Cl. 435-220.000.
deWeaver, Fred, II. Propulsion system. 4,479,396, Cl. 74-84.00R.
Dewees, John G.: *See*—
Franklin, Robert P.; and Dewees, John G., 4,479,583, Cl. 211-49.00D.
Diamond Oil Well Drilling Co.: *See*—
Park, Arthur; and Wilson, Bob T., 4,479,557, Cl. 175-59.000.
Diamond Shamrock Chemicals Company: *See*—
Papalos, John G.; and Savoly, Arpad, 4,479,826, Cl. 106-90.000.
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, to Johnson & Johnson Baby Products Company. Method for effecting securement of alternating stretched and unstretched elastic ribbon to a moving web. 4,479,836, Cl. 156-164.000.
Didier-Werke AG: *See*—
Simon, Gunter, 4,479,777, Cl. 432-179.000.
DiDio, Gary M.: *See*—
Doehler, Joachim; Hoffman, Kevin R.; Laarman, Timothy D.; DiDio, Gary M.; and McDonough, Therese, 4,479,455, Cl. 118-718.000.
Didner, Robert S. Zoned control system. 4,479,604, Cl. 236-49.000.
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Owens, Robert A.; and Diener, Theodor O., 4,480,040, Cl. 436-504.000.
Dills, Raymond L., to General Electric Company. Food browning system incorporating a combined microwave and hot air oven. 4,480,164, Cl. 219-10.55B.
Diolight Technology, Inc.: *See*—
Monahan, Russel; and Keating, Kevin J., 4,480,212, Cl. 315-71.000.
DiPaola, Vincent J.; Collins, William H.; and Sherman, Louis M., to United States of America, Army. Compositions and method for degrading foodstuffs. 4,479,889, Cl. 252-365.000.
Di Rosa, Gaetano, to FATA European Group S.p.A. Translator-bar conveyor installation. 4,479,576, Cl. 198-774.000.
Discovision Associates: *See*—
Wilkinson, Richard L., 4,480,270, Cl. 358-310.000.
Dixon, George D.; Saunders, Howard E.; Gause, Smith A.; and Goldberg, Newton N., to Westinghouse Electric Co. Arc and track resistant articles utilizing photosensitive sag resistant cycloaliphatic epoxy resin coating compositions. 4,479,990, Cl. 428-36.000.
Djordjevic, Ilija; Bruhmann, Werner; Ritter, Ernst; and Frey, Hansjorg, to Robert Bosch GmbH. Rpm Governor for fuel-injected internal combustion engines, in particular a final idling rpm governor of an injection pump for diesel vehicle engines. 4,479,474, Cl. 123-373.000.
Dobrovolny, Pierre, to Zenith Electronics Corporation. Lowpass-highpass electronic switch. 4,480,338, Cl. 455-188.000.
Dr. August Wolff, Chemisch-Pharmazeutische Fabrik GmbH & Co. KG.: *See*—
Eckert, Theodor; Nolting, Siegfried; and Kemper, Fritz, 4,479,939, Cl. 424-172.000.
Dr. Willmar Schwabe GmbH & Co.: *See*—
Klessing, Klaus; and Chatterjee, Shyam S., 4,479,951, Cl. 424-248.570.
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Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.

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Holmes, David G.; Novak, Richard A.; and McNabb, Jacques Y., 4,479,757, Cl. 416-186.00R.

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Klun, Robert T.; Murchison, Craig B.; and Hucul, Dennis A., 4,480,121, Cl. 560-206.000.
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Drake, Charles A., to Phillips Petroleum Company. Cleavage of hydroperoxides. 4,480,141, Cl. 568-798.000.

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Dudgeon, Charles D., to General Electric Company. Epoxy adhesives for poly(butylene terephthalate). 4,480,059, Cl. 523-466.000.

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Alman, David H., 4,479,718, Cl. 356-405.000.
Ashcraft, Robert W.; and Koenigkramer, Rusty E., 4,480,026, Cl. 430-510.000.
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Barnette, William E., 4,479,901, Cl. 260-239.0BD.
Cheng, Yih-Shyun E., 4,480,038, Cl. 435-261.000.
Coughlin, Michael C.; and Schenck, Timothy T., 4,480,061, Cl. 524-13.000.
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., 4,480,042, Cl. 436-533.000.
Dear, Terrence A.; and Hughes, Allan B., 4,479,509, Cl. 137-560.000.
Prober, James M., 4,479,979, Cl. 427-9.000.
Wu, James C., 4,480,051, Cl. 502-338.000.

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Long, John G., 4,479,713, Cl. 355-74.000.

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Dutt, William R.: *See*—
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Enderle, Susan J., 4,480,054, Cl. 521-84.100.

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Robertiello, Andrea; Angelini, Leonello; and Degen, Ludwig, 4,479,978, Cl. 426-636.000.

E. and U. Gertsch AG, Ski-Produkte: *See*—
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Bailey, David B.; and Abel, Edward P., 4,480,080, Cl. 526-318.000.
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Brown, William T.; and Simons, Robert M., 4,480,132, Cl. 568-42.000.
Chang, Hao J.; Popp, Gerhard; and Saturno, Patrick H., 4,480,025, Cl. 430-206.000.
Clonce, Ambrose J.; Palmer, Michael; and Gott, Samuel L., 4,480,116, Cl. 560-4.000.
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Kuo, Chung-Ming; and Leonard, Alan P., 4,480,090, Cl. 536-58.000.
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Trotter, Jimmy R.; Joyner, Frederick B.; and McConnell, Richard L., 4,480,087, Cl. 528-302.000.

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Eggers, Fredrick W., to Federal Signal Corporation. Flash lamp and circuitry for use with an incandescent light. 4,480,211, Cl. 315-70.000.

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Eichner, Falk J.; Ramsdale, Douglas S.; and Bourbon, Jean, to Fellowes Manufacturing Co., Eichner Systems Division. Pivotal filing container for magnetic disks. 4,479,577, Cl. 206-45.180.

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Einhaus, Albert: *See*—
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Eley, Fred N. Well-cementing stage collar. 4,479,545, Cl. 166-318.000.
Eli Lilly and Company: *See*—
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Hung Ann H.; and Merkel, Kurt E., 4,479,897, Cl. 260-112.50R.
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Eliot, Sigdon A. Protective glove system. 4,479,571, Cl. 192-129.00A.
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Chopra, Kuldip S.; Ealer, George E.; and Salensky, George A., 4,480,064, Cl. 524-413.000.
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Ely, Richard I.; and Mosier, Carl E., to Burroughs Corporation. Single plane optical membrane switch and keyboard. 4,480,182, Cl. 250-227.000.
Ely, Richard I.; and Subbarao, Wunnava V., to Burroughs Corporation. Multi-plane optical membrane switch apparatus. 4,480,183, Cl. 250-227.000.
Ely, Richard I., to Burroughs Corporation. Molded optical waveguide switching apparatus. 4,480,184, Cl. 250-227.000.
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Erlich, Egon. An adhesive sign and method of making. 4,479,319, Cl. 40-595.000.
Ernst Leitz Wetzlar GmbH: *See*—
Reichel, Artur; and Richter, Kurt, 4,479,402, Cl. 74-625.000.
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Esco Co., Ltd.: *See*—
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ESPE Fabrik pharmazeutischer Praparate GmbH: *See*—
Herold, Wolf-Dietrich; Grimm-Lenz, Rainer; and Burger, Bernd, 4,479,781, Cl. 433-90.000.
Esposito, Antonio; Neri, Carlo; and Buonomo, Franco, to Anic S.p.A. Process for oxidizing alcohols to aldehydes and/or ketones. 4,480,135, Cl. 568-385.000.
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Lilje, Kenneth C., 4,479,904, Cl. 260-465.00E.
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Nord, Keith W., 4,479,345, Cl. 53-564.000.
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Warchol, Mark P.; and Gale, Walter W., 4,479,542, Cl. 166-273.000.
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Fung, Shun C.; Weissman, Walter; and Carter, James L., 4,480,046, Cl. 502-35.000.
Guide, John J.; Carey, Joseph E., Jr.; Eichamer, Paul D.; Claypole, George; and Yenetchi, George V., 4,479,355, Cl. 60-683.000.
Lundberg, Robert D.; Peiffer, Dennis G.; and Phillips, Robert R., 4,480,063, Cl. 524-399.000.
Masterson, David C.; and Van Dorn, Warren G., 4,479,997, Cl. 428-212.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,480,137, Cl. 568-454.000.
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Hickling, Robert L., 4,480,315, Cl. 364-900.000.
Varshney, Ramesh C.; and Strain, Robert J., 4,480,199, Cl. 307-303.000.
Faldt, Inge; and Bjorklund, Leif. Method and apparatus for thermal decomposition of stable compounds. 4,479,443, Cl. 110-346.000.
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Fastway Fasteners, Inc.: *See*—
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Fecteau, Gilles, to Hydro Quebec. Machine and method for assembling high voltage fuses without an internal core. 4,479,299, Cl. 29-623.000.
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Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., 4,479,588, Cl. 220-416.000.
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Feinland, Seymour; Freeman, Gerald C.; Viera, Vincent F.; and Sette, Paul R., to Pitney Bowes Inc. Weighing cell. 4,479,561, Cl. 177-154.000.
Feldmann, Hugo; Illert, Karl; Benz, Willi; and Bohnenkamp, Heinrich, to SMS Schloemann-Siemag AG. Strip-rolling method and apparatus. 4,479,374, Cl. 72-236.000.
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Fernandez, Jose ; Herm, Jurgen; Krakow, Heinz; Tomsen, Harald; and Wortmann, Ernst, deceased (by Wortmann, Elfriede, legal representative), to Thyssen Stahl Aktiengesellschaft. Apparatus for the manufacture of hollow cylindrical bodies. 4,479,602, Cl. 228-48.000.
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Fesmire, Robert H.; and Hansen, Warren T., to Ellis Corporation. Washing and extracting machine. 4,479,371, Cl. 68-23.100.
Festa, Lawrence M. Musical-output adapter for telephones. 4,480,153, Cl. 179-84.00T.
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Fieldhouse, John W., 4,480,012, Cl. 428-506.000.
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Whitesides, George M.; and Mazenod, Francois P., 4,480,111, Cl. 549-477.000.
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Fisher, Charles R. Cartridge assembly for data-sensing system. 4,480,180, Cl. 235-475.000.
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Fitch, John L.: *See—*
Spencer, Donald B.; and Fitch, John L., 4,480,254, Cl. 343-708.000.
Fix, Wilbur L. Cylinder lock for revolvers. 4,479,320, Cl. 42-1.0LP.
Fjeldsted, John C.: *See—*
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., 4,479,380, Cl. 73-61.10C.
Fletcher, Ian J., to Ciba-Geigy Corporation. Chromogenic quinazolines. 4,480,096, Cl. 544-289.000.
Floyd, Don D.; and Whittle, Lee M. Bale tagging apparatus. 4,479,427, Cl. 100-102.000.
Flynn, Robert E. Fuel-measuring flow system for diesel engines. 4,479,465, Cl. 123-514.000.
Fogarty, Thomas J.; and Chin, Albert K., to Fogarty, Thomas J. Double lumen dilatation catheter. 4,479,497, Cl. 128-344.000.
Fogg, O. Douglas: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,480,317, Cl. 364-900.000.
Fong, Jones W., to Sandoz, Inc. Process for preparation of microspheres and modification of release rate of core material. 4,479,911, Cl. 264-4.600.
Ford Aerospace & Communications Corporation: *See—*
Juul, Peter A., 4,480,233, Cl. 331-56.000.
Ford, John M. B., to Realex Corporation. Plunger lock for manual dispensing pump. 4,479,589, Cl. 222-153.000.
Ford Motor Company: *See—*
Felice, Mario J.; and Mayers, Walter T. (said Mario J. Felice assors. to), 4,479,461, Cl. 123-90.650.
Kordomenos, Panagiotis I.; Alexander, Delores J.; and Thomson, David M., 4,480,084, Cl. 528-118.000.
Theodore, Ares N.; and Chattha, Mohinder S., 4,480,069, Cl. 524-504.000.
Wade, Wallace R., 4,479,473, Cl. 123-341.000.
Watanabe, Shunso F., 4,479,393, Cl. 74-89.150.
Fory, Werner: *See—*
Meyer, Willy; and Fory, Werner, 4,479,821, Cl. 71-93.000.
Foster, Charles H., to Eastman Kodak Company. Process for separation of tocopherol homologues. 4,480,108, Cl. 549-413.000.
Foster Wheeler Energy Corporation: *See—*
Goidich, Stephen J.; Robertson, Archibald; and Wolowodiuk, Walter, 4,479,458, Cl. 122-4.00D.
Fouletier, Jacques: *See—*
Siebert, Elisabeth; Fouletier, Jacques; and Vilminot, Serge, 4,479,867, Cl. 204-426.000.
Fowler, Donald W.: *See—*
Bresie, Don A.; Burns, Jack M.; and Fowler, Donald W., 4,479,546, Cl. 166-369.000.
Fraden, Jacob. Toy including motion-detecting means for activating same. 4,479,329, Cl. 446-175.000.
Fraige, Richard. Waterbed mattress with functionally nonredundant inner bladder means for wave attenuation. 4,479,275, Cl. 5-450.000.
Franke, Heinrich: *See—*
Arndt, Friedrich; Franke, Heinrich; Schmidt, Erich; and Puttner, Reinhold, 4,479,822, Cl. 71-111.000.
Franklin, Leonard N., Jr.: *See—*
Anderson, Stanley E.; and Franklin, Leonard N., Jr., 4,479,764, Cl. 417-299.000.
Franklin, Robert P.; and Dewees, John G., to Trans-World Manufacturing Corporation. Gravity feed display racks with means for presentation of units of merchandise and for reloading. 4,479,583, Cl. 211-49.00D.
Franssen, Nico V., deceased: *See—*
Van Kessel, Theodorus J.; Franssen, Nico V., deceased; and de Haan, Friedrich J., administrator, 4,480,229, Cl. 330-84.000.
Fransson, George E.: *See—*
Johnson, Stuart J.; and Fransson, George E., 4,479,745, Cl. 409-12.000.
Frantzen, John J., to Koltron Corporation. Etchant removal apparatus and process. 4,479,849, Cl. 156-640.000.
Franz Bahnbaumaschinen-Industriegesellschaft m.b.H: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,479,439, Cl. 104-7.00R.
Frazer, John M.: *See—*
Schwitters, Steven W.; and Frazer, John M., 4,479,423, Cl. 99-455.000.
Freeman, Gerald C.: *See—*
Feinland, Seymour; Freeman, Gerald C.; Viera, Vincent F.; and Sette, Paul R., 4,479,561, Cl. 177-154.000.
Frenken, Hans: *See—*
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,479,987, Cl. 427-402.000.
Frey, Hansjorg: *See—*
Djordjevic, Ilija; Bruhmann, Werner; Ritter, Ernst; and Frey, Hansjorg, 4,479,474, Cl. 123-373.000.
Frey, William A.: *See—*
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., 4,480,042, Cl. 436-533.000.
Frick, Donald C.: *See—*
Jackson, George R.; and Frick, Donald C., 4,479,377, Cl. 73-3.000.
Friedman, Arthur J., to Merck & Co., Inc. Pyrazine aldimine compounds as antimicrobial agents. 4,479,953, Cl. 424-250.000.
Fries, Bernard J.; Faiks, Frederick S.; and Korell, Donald D., to Steelcase Inc. Body weight chair control. 4,479,679, Cl. 297-300.000.
Froeb, John W.; and Engstrom, Keith A., to Illinois Tool Works Inc. Force transducer. 4,479,392, Cl. 73-862.680.
Froncisz, Wojciech: *See—*
Hyde, James S.; and Froncisz, Wojciech, 4,480,239, Cl. 333-219.000.
Frushtick, Leonard, to Leonard Automatics, Inc. Trouser finisher with extended exterior dress point. 4,479,313, Cl. 38-42.000.
Frushtick, Leonard, to Leonard Automatics, Inc. Trouser finisher with independently retractable and extendable waist and leg expanders. 4,479,314, Cl. 38-42.000.
Frushtick, Leonard, to Leonard Automatics, Inc. Steaming apparatus for a vertical side chest in a trouser presser. 4,479,315, Cl. 38-42.000.
Fry, Warren C., to Westinghouse Electric Corp. Multiple output DC-to-DC voltage converter apparatus. 4,480,298, Cl. 363-28.000.
Fuchs, Uwe, to Linde Aktiengesellschaft. Process and apparatus for the biological purification of wastewater. 4,479,876, Cl. 210-605.000.
Fuini, Dennis L.: *See—*
Newton, Charles L.; and Fuini, Dennis L., 4,479,350, Cl. 60-655.000.
Fuji Photo Film Co., Ltd.: *See—*
Ichijima, Seiji; Ohki, Nobutaka; Satomura, Masato; and Iwakura, Ken, 4,480,052, Cl. 346-208.000.
Kondo, Syunichi; Sato, Hideo; Honjo, Satoru; and Umehara, Akira, 4,480,020, Cl. 430-81.000.
Fuji Xerox Co., Ltd.: *See—*
Nakajima, Hisao; and Leng, Svay, 4,479,615, Cl. 242-68.400.
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,480,258, Cl. 346-135.100.
Tan, Yoichi; and Miyao, Fumio, 4,480,200, Cl. 307-354.000.
Fuchi, Makoto; and Takayama, Makoto, to Canon Kabushiki Kaisha. Information recording device. 4,480,273, Cl. 360-19.100.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.
Fujita, Mituo, to Kabushiki Kaisha Shinsei Industries. Manually-operated labeler. 4,479,842, Cl. 156-384.000.
Fujitsu Fanuc Limited: *See—*
Inaba, Hajimu; Nakajima, Seiichiro; Sakakibara, Shinsuke; and Nihei, Ryo, 4,479,673, Cl. 294-88.000.
Inaba, Hajimu; and Inagaki, Shigemi, 4,479,754, Cl. 414-728.000.
Fujitsu Limited: *See—*
Aoyama, Keizo, 4,480,321, Cl. 365-189.000.
Fukase, Masaaki: *See—*
Nisizawa, Jun-ichi; and Fukase, Masaaki, 4,479,845, Cl. 156-601.000.
Fukushima, Osamu: *See—*
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,479,686, Cl. 339-17.0LC.
Fulmer, John W., to General Electric Company. Process for preparing phenol and acetone from cumene. 4,480,134, Cl. 568-385.000.
Funahashi, Akira: *See—*
Tsubouchi, Kaoru; and Funahashi, Akira, 4,479,915, Cl. 264-249.000.
Funatsu, Noboru. Molding aid for cranioplasty. 4,479,629, Cl. 249-53.00R.
Fung, Shun C.; Weissman, Walter; and Carter, James L., to Exxon Research & Engineering Co. Reactivation process for iridium-containing catalysts using low halogen flow rates. 4,480,046, Cl. 502-35.000.
Funk, James E., to Alfred University Research Foundation, Inc. Stabilized slurry and process for preparing same. 4,479,806, Cl. 44-51.000.

Furuta, Tsutomu: *See*—
Kondou, Masatsune; Itou, Kazuhiro; and Furuta, Tsutomu, 4,480,170, Cl. 219-125.100.

G. D. Searle & Co.: *See*—
Dryden, Hugh L.; and Hill, John B., 4,480,112, Cl. 549-478.000.

Gabler, Dieter, to Ranco Incorporated. Water flow control valve. 4,479,670, Cl. 251-328.000.

Gagnon, Peter R.; Lumia, John J.; Leadvaro, Stephen J.; and Morris, James C., to GTE Products Corporation. Two-filament lamp for automobile headlight. 4,480,296, Cl. 362-211.000.

Galasco, Raymond T.: *See*—
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; and Light, Daivd N., 4,479,852, Cl. 204-1.00T.

Gale, Walter W.: *See*—
Warchol, Mark P.; and Gale, Walter W., 4,479,542, Cl. 166-273.000.

Galperin, Eduard I.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.

Galvis, Oscar, to Rain Bird Consumer Products Mfg. Corp. Pop-up sprinkler. 4,479,611, Cl. 239-205.000.

Ganter, Walter, to Theisen GmbH. Apparatus for scrubbing gases. 4,479,816, Cl. 55-230.000.

Garau, John E.: *See*—
Carothers, Charles H.; Garau, John E.; and Basa, Thomas P., 4,480,245, Cl. 337-180.000.

Gardner, Douglas S. Chain saw attachment. 4,479,303, Cl. 30-383.000.

Garton, Andrew: *See*—
McLean, Paul D.; Garton, Andrew; Scott, Robert F.; and Gransden, Susan E., 4,480,082, Cl. 528-103.000.

Gass, Raymond, to La Telephonie Industrielle et Commerciale Telic Alcatel. Device for increasing the operational security of a duplicated clock. 4,480,198, Cl. 307-269.000.

Gause, Smith A.: *See*—
Dixon, George D.; Saunders, Howard E.; Gause, Smith A.; and Goldberg, Newton N., 4,479,990, Cl. 428-36.000.

Gavrin, Edward S.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.

Gazdik, Charles E.; and McBride, Donald G., to International Business Machines Corporation. Multi-layer flexible film module. 4,480,288, Cl. 361-398.000.

Gazzea, Sergio: *See*—
Farronato, Silvestro; and Gazzea, Sergio, 4,480,008, Cl. 428-425.800.

Geis, Michael W.: *See*—
Smith, Henry I.; and Geis, Michael W., 4,479,846, Cl. 156-603.000.

Gelernt, Barry, to Perkin-Elmer Corporation, The. Regenerable cold trap for aluminum chloride effluent. 4,479,927, Cl. 423-481.000.

GenCorp Inc.: *See*—
Lapham, Darrell L., 4,479,522, Cl. 157-1.000.

General Dynamics, Pomona Division: *See*—
Wong, Joseph S.; Chung, Kuo-Ing; and Rudenauer, Kenneth A., 4,480,336, Cl. 455-328.000.

General Electric Company: *See*—
Baker, Lewin T.; and Orlowski, Eugene J., Jr., 4,480,232, Cl. 331-1.00A.
Bottomley, Paul A., 4,480,228, Cl. 324-309.000.
Castonguay, Roger N.; and Jencks, Charles L., 4,480,242, Cl. 335-194.000.
Dills, Raymond L., 4,480,164, Cl. 219-10.55B.
Dudgeon, Charles D., 4,480,059, Cl. 523-466.000.
Fulmer, John W., 4,480,134, Cl. 568-385.000.
Grahame, Frederick W., 4,480,285, Cl. 361-306.000.
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,480,207, Cl. 310-156.000.
Pauze, Denis R., 4,480,007, Cl. 428-379.000.

General Foods Corporation: *See*—
Schenz, Anne F., 4,479,974, Cl. 426-590.000.
Soukup, Robert J.; and Parliment, Thomas H., 4,479,972, Cl. 426-536.000.
Szczesniak, Alina S.; and Schenz, Anne F., 4,479,975, Cl. 426-590.000.

General Foods Inc.: *See*—
Eng, Jean L.; and Mackenzie, Kathleen M., 4,479,971, Cl. 426-330.000.

General Foods Limited: *See*—
Holley, Edward J., 4,479,973, Cl. 426-573.000.

General Instrument Corp.: *See*—
Naiff, Kenneth L., 4,480,320, Cl. 365-189.000.

General Kap Corporation: *See*—
Caazar, Ernest J., 4,479,586, Cl. 215-258.000.

General Motors Corporation: *See*—
Anderson, Stanley E.; and Franklin, Leonard N., Jr., 4,479,764, Cl. 417-299.000.
Leech, Howard E., 4,480,166, Cl. 219-118.000.
Robertson, Gerald F.; Pozniak, Donald J.; and McClain, Michael J., 4,479,765, Cl. 417-380.000.
Zankl, Kurt O., 4,479,675, Cl. 296-37.160.

General Signal Corporation: *See*—
Westveer, Robert C., 4,479,349, Cl. 60-420.000.

General Tire & Rubber Company, The: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,480,076, Cl. 525-261.000.

Genicom Corporation: *See*—
Mailer, Werner H.; and Sipe, Henry C., 4,479,598, Cl. 226-74.000.

George E. Failing Company: *See*—
Breed, William F., 4,479,508, Cl. 137-516.250.

Gerard, William A., to Varian Associates, Inc. Coaxial magnetron with improved starting. 4,480,235, Cl. 331-91.000.

Gerbaz, Giampaolo: *See*—
Koch, Paolo; Mattei, Luciano; and Gerbaz, Giampaolo, 4,479,888, Cl. 252-357.000.

Germann, Albrecht J., to Koenig & Bauer Aktiengesellschaft. Collect-printing unit for security printing for use in a rotary printing press. 4,479,431, Cl. 101-136.000.

Gertsch, Ullrich, to E. and U. Gertsch AG, Ski-Produkte. Ski safety binding. 4,479,664, Cl. 280-618.000.

Gerzon, Koert: *See*—
Cullinan, George J.; and Gerzon, Koert, 4,479,957, Cl. 424-262.000.

Gessinger, Gernot; and Schroder, Gunther, to BBC Brown, Boveri & Company, Limited. Process for manufacturing a semi-finished product or a finished component from a metallic material by hot working. 4,479,833, Cl. 148-11.50R.

Gewerkschaft Eisenhutte Westfalia: *See*—
Grundken, Dieter; Bruggemann, Reinhold; Linke, Horst; and Redder, Manfred, 4,479,575, Cl. 198-735.000.

Ghermignari, Alberto: *See*—
Rinaldi, Rinaldo; Ghermignari, Alberto; and Marcori, Claudio, 4,479,526, Cl. 160-22.000.

Gibbs, George R.: *See*—
Lapatovich, Walter P.; Gibbs, George R.; and Proud, Joseph M., 4,480,213, Cl. 315-248.000.

Gibson, Peter H.; and Taylor, Robert I., to BOC Group plc, The. Freezing a liquid. 4,479,363, Cl. 62-63.000.

Giesbrecht, Hartmut: *See*—
Bung, Richard; Giesbrecht, Hartmut; Leuckel, Wolfgang; and Klimisch, Hans-Joachim, 4,479,493, Cl. 128-204.180.

Gilbert, Bruce, to Hughes Tool Company. Setting tool adapter kit. 4,479,548, Cl. 166-387.000.

Gill, Elbert R.; and Adams, Ladd M., to Gill Industries, Inc. Drilling sub. 4,479,558, Cl. 175-320.000.

Gill Industries, Inc.: *See*—
Gill, Elbert R.; and Adams, Ladd M., 4,479,558, Cl. 175-320.000.

Gill, John D., to Elastomer Energy Recovery, Inc. Elastomeric energy recovery system. 4,479,356, Cl. 60-699.000.

Gilman, Thomas; and Miller, Frank N., to Kendall Company, The. Scrub brush. 4,479,277, Cl. 15-111.000.

Gilvarg, Charles; and Kingsbury, William D., to SmithKline Beckman Corporation. Oligopeptide prodrugs. 4,479,898, Cl. 260-112.50R.

Glemming, David A.: *See*—
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winalow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.

Gloeckler, Alfred, to Superba S.A. Programmable knitting machine. 4,479,368, Cl. 66-75.200.

GNB Batteries Inc.: *See*—
Savage, Douglas R., 4,479,300, Cl. 29-623.100.

Goad, Bobby F.: *See*—
Callihan, Rudy B.; Goad, Bobby F.; and Miller, Gary A., 4,479,544, Cl. 166-290.000.

Goans, Kip B., to Baker Cac, Inc. Conduit blowout preventer. 4,479,506, Cl. 137-73.000.

Goidich, Stephen J.; Robertson, Archibald; and Wolowodiuk, Walter, to Foster Wheeler Energy Corporation. Hexagonal pressurized fluidized bed reactor. 4,479,458, Cl. 122-4.00D.

Gold, Barry L.: *See*—
Bolesky, Richard C.; Farling, Gene M.; and Gold, Barry L., 4,479,271, Cl. 3-1.911.

Goldberg, Newton N.: *See*—
Dixon, George D.; Saunders, Howard E.; Gause, Smith A.; and Goldberg, Newton N., 4,479,990, Cl. 428-36.000.

Gonzalez, Carlos F.: *See*—
Vandenbergh, Peter A.; and Gonzalez, Carlos F., 4,479,936, Cl. 424-93.000.

Goode, John T. Liner for tower silo and method of installing same. 4,479,334, Cl. 52-197.000.

Goodyear Tire & Rubber Company, The: *See*—
Graas, Maurice, 4,479,525, Cl. 152-209.00R.
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.
Gujarathi, Ramesh N., 4,480,078, Cl. 526-65.000.
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,479,381, Cl. 73-66.000.
Sabins, Kenneth C., 4,479,296, Cl. 29-527.100.

Goose, John: *See*—
Brooker, Peter J.; and Goose, John, 4,479,960, Cl. 424-270.000.

Gordebeke, John H., to Xerox Corporation. Diagnostic routine selector and display. 4,480,329, Cl. 371-20.000.

Gores, Kenneth W. Apparatus for positioning a dental dowel. 4,479,780, Cl. 433-74.000.

Gotaverken Arendal AB: *See*—
Lundberg, Thorsten, 4,479,450, Cl. 114-46.000.

Goto, Tokuju: *See—*
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,479,369, Cl. 68-5.00C.

Gotoh, Yoshihisa: *See—*
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.

Gott, Samuel L.: *See—*
Clonce, Ambrose J.; Palmer, Michael; and Gott, Samuel L., 4,480,116, Cl. 560-4.000.

Gougouyan, Yves; and Basseville, Philippe, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Alumina-based ceramic composition and substrate obtained by means of this composition. 4,480,045, Cl. 501-153.000.

Gould, Harry J. Apparatus for separating rf ground plane from housing. 4,480,240, Cl. 333-246.000.

Graas, Maurice, to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,479,525, Cl. 152-209.00R.

Gradl, Reinhard: *See—*
von Plessen, Helmold; Gradl, Reinhard; and Schimmel, Gunther, 4,479,924, Cl. 423-321.00R.

Grafe, Robert J.; and Leikam, Gary E., to International Business Machines Corporation. Text processing system with communication data save facility. 4,480,308, Cl. 364-200.000.

Grahame, Frederick W., to General Electric Company. Capacitor. 4,480,285, Cl. 361-306.000.

Grand Rapids Label Company: *See—*
Tasma, Gerald W., 4,479,839, Cl. 156-249.000.

Grandadam, Pierre: *See—*
Constanti, Jean; and Grandadam, Pierre, 4,480,290, Cl. 361-433.000.

Gransden, Susan E.: *See—*
McLean, Paul D.; Garton, Andrew; Scott, Robert F.; and Gransden, Susan E., 4,480,082, Cl. 528-103.000.

Graziadei, Rinaldo; and Lorusso, Michelangelo, to SGS-ATES Componenti Elettronici S.p.A. Transistor mixer and amplifier input stage. 4,480,337, Cl. 455-333.000.

Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., to Goodyear Tire & Rubber Company, The. System for testing a tire to avoid a torque steer effect. 4,479,382, Cl. 73-146.000.

Greenley, Gordon A.: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,480,317, Cl. 364-900.000.

Greenway, Donald O.; and Davis, Frank J. Natural gas and air mixing device. 4,479,466, Cl. 123-527.000.

Greenwood, John C., to International Standard Electric Corporation. Electrical switch device with an integral semiconductor contact element. 4,480,162, Cl. 200-181.000.

Greenwood [illegible]on D.; and Dye, Clifford L., to Eaton Stamping Company. Ele[illegible] starter with confined cushion. 4,479,394, Cl. 74-7.00R.

Greenwood, William S.; Weinmann, Karl; and Weindel, Reinhold, to Thomas & Betts Corporation. Receptacle for flat multiconductor cable. 4,479,692, Cl. 339-99.00R.

Grenier, Maurice, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Gasification of coal. 4,479,540, Cl. 166-260.000.

Grimm-Lenz, Rainer: *See—*
Herold, Wolf-Dietrich; Grimm-Lenz, Rainer; and Burger, Bernd, 4,479,781, Cl. 433-90.000.

Gross, Manfred: *See—*
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.

Grossmann, Horst; Meier, Rolf; and Schmid, Karl, to Black & Decker Inc. Power tool having a plastics material housing. 4,479,555, Cl. 173-171.000.

Growney, Lawrence J.: *See—*
Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., 4,479,588, Cl. 220-416.000.

Gruenfeld, Norbert, to Ciba-Geigy Corporation. 1-Carboxyalkanoylindoline-2-carboxylic acids. 4,479,963, Cl. 424-274.000.

Grundken, Dieter; Bruggemann, Reinhold; Linke, Horst; and Redder, Manfred, to Gewerkschaft Eisenhutte Westfalia. Retaining device. 4,479,575, Cl. 198-735.000.

Grushkin, Bernard, to Xerox Corporation. Radiant assist pressure fixing process with polyamide toner compositions. 4,480,023, Cl. 430-124.000.

GTE Automatic Electric Inc.: *See—*
Magnusson, Stig E.; Puccini, Sergio E.; and Parikh, Kamal I., 4,480,330, Cl. 370-110.200.

GTE Laboratories Incorporated: *See—*
Lapatovich, Walter P.; Gibbs, George R.; and Proud, Joseph M., 4,480,213, Cl. 315-248.000.

GTE Products Corporation: *See—*
Gagnon, Peter R.; Lumia, John J.; Leadvaro, Stephen J.; and Morris, James C., 4,480,296, Cl. 362-211.000.
Kasenga, Anthony F., 4,479,886, Cl. 252-301.40R.
Lubold, Harvey C., Jr.; and Roberts, Glenn H., 4,479,521, Cl. 141-12.000.
Manchester, Stephen T., 4,479,477, Cl. 123-557.000.

Guallo, Max: *See—*
Deborde, Albert H.; and Guallo, Max, 4,479,519, Cl. 139-450.000.

Guide, John J.; Carey, Joseph E., Jr.; Eichamer, Paul D.; Claypole, George; and Yenetchi, George V., to Exxon Research & Engineering Co. Power plant integrating coal-fired steam boiler with air turbine. 4,479,355, Cl. 60-683.000.

Gujarathi, Ramesh N., to Goodyear Tire & Rubber Company, The. Continuous emulsion polymerization process. 4,480,078, Cl. 526-65.000.

Gulette, Ronald S.; and Lobanoff, Mark, to Irvin Industries. Pickup truck tonneau cover. 4,479,677, Cl. 296-98.000.

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Bruce, John C., 4,479,742, Cl. 405-217.000.

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Hollingsworth, William C., 4,479,283, Cl. 17-49.000.

Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, to Hewlett-Packard Company. Logic state analyzer with graph of captured trace. 4,480,317, Cl. 364-900.000.

Haas, Howard C.; Jasne, Stanley J.; and Moreau, Robert D., to Polaroid Corporation. Itaconamide compounds and method of preparation. 4,480,125, Cl. 564-144.000.

Haase, Hans J.: *See—*
Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, 4,480,202, Cl. 310-12.000.

Haberer, Thomas G.: *See—*
Tinker, Craig S.; and Haberer, Thomas G., 4,479,815, Cl. 55-163.000.

Haberstumpf, Harold E., to Allen Organ Company. Tracker action touch for keys in a keyboard musical instrument. 4,479,415, Cl. 84-439.000.

Hackemesser, Larry G.: *See—*
Petterson, William C.; and Hackemesser, Larry G., 4,479,869, Cl. 208-130.000.

Hackman, E. B.; and Zeagler, L. D., to Celanese Corporation. Hydroformylation process. 4,480,138, Cl. 568-454.000.

Hadhazy, Pal: *See—*
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.

Hadley, Michael S., to Beecham Group P.L.C. Decahydroquinolyl benzamides. 4,480,099, Cl. 546-164.000.

Haeseker, Willy; Vignal, Robert; and Ferrand, Guy, to Matec Holding AG. Sound absorbing structural element. 4,479,992, Cl. 428-116.000.

Hafner, Walter V.: *See—*
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Hair, Victor D., to International Business Machines Corporation. Direct detection of back EMF in permanent magnet step motors. 4,480,218, Cl. 318-696.000.

Halcon SD Group, Inc., The: *See—*
Becker, Mitchell; and Sachs, Howard M., 4,480,127, Cl. 564-402.000.
Brill, William F., 4,480,113, Cl. 549-531.000.

Haldeman, David: *See—*
Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, 4,480,217, Cl. 318-618.000.

Hale, Robert R.: *See—*
McDougal, Allan R.; and Hale, Robert R., 4,479,485, Cl. 126-439.000.

Halliburton Company: *See—*
Bravenec, Frank R., 4,479,383, Cl. 73-151.000.

Hallstrom, Bengt O. Cleaning trolley. 4,479,[illegible]2, Cl. 15-311.000.

Halper, Barry J.: *See—*
McWhorter, Thomas E.; and Halper, Barry J., 4,479,362, Cl. 62-63.000.

Halpern, Yuval; and Mott, Donna M., to Borg-Warner Chemicals, Inc. Amines salts of phosphoric acid. 4,480,093, Cl. 544-195.000.

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Lalancette, Jean M.; and Hamelin, Hugues, 4,479,828, Cl. 106-308.00B.

Hammershaimb, Harold U.; and Lomas, David A., to JOP Inc. Use of lift gas in an FCC reactor riser. 4,479,870, Cl. 208-164.000.

Hamprecht, Rainer, to Bayer Aktiengesellschaft. Red dyeing 2,6-dicyano-2'-sulfonamido-4'-amino-azo-benzenes. 4,479,899, Cl. 260-205.000.

Handi-Pac, Inc.: *See—*
Klawitter, Ronald R., 4,479,328, Cl. 446-237.000.

Haneda, Satoshi: *See—*
Syukuri, Kastuhiro; Haneda, Satoshi; and Itaya, Masahiko, 4,479,709, Cl. 355-15.000.

Hanna, Ivan E. Electrical circuit marking identification plate. 4,479,317, Cl. 40-2.00R.

Hanna, Marie R.: *See—*
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,480,136, Cl. 568-445.000.

Hansen, Guenter: *See—*
Zeidler, Georg; Hansen, Guenter; and Schulte, Wolfgang, 4,479,906, Cl. 260-169.000.

Hansen, Nestor P.: *See*—
Tortorello, Anthony J.; and Hansen, Nestor P., 4,480,083, Cl. 528-111.000.
Hansen, Warren T.: *See*—
Fesmire, Robert H.; and Hansen, Warren T., 4,479,371, Cl. 68-23.100.
Hara, Kunio, to Nifco Inc. Hydraulic rivet driver. 4,479,601, Cl. 227-130.000.
Hara, Kunio, to Nifco Inc. Thermal cutout fuse. 4,480,247, Cl. 337-407.000.
Hara, Teruya; and Ina, Kenzo, to Canon Kabushiki Kaisha. Information processing system. 4,480,277, Cl. 360-69.000.
Harng, Goan. Release device of double-shade umbrella. 4,479,504, Cl. 135-20.00A.
Harper, Harold K.: *See*—
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.
Harris Corporation: *See*—
Shackle, Peter W.; and Pospisil, Robert S., 4,480,219, Cl. 318-729.000.
Harris Graphics Corporation: *See*—
Seidel, Randy R., 4,479,643, Cl. 270-55.000.
Harris, Richard W., to Sperry Corporation. Channelized serial adaptive filter processor. 4,480,236, Cl. 333-174.000.
Hart, Robert G.; and Townsend, Herbert E., to Bethlehem Steel Corporation. Method of producing light absorptive surface on aluminum zinc alloy coated product. 4,479,832, Cl. 148-6.14R.
Hartley, William H.: *See*—
Nance, Roy A.; Hartley, William H.; and Caffarel, Alfred J., 4,480,225, Cl. 324-238.000.
Haryu, Koichi, to Yoshino America Corporation. Multi-color printing apparatus of surfaces of bodies of rotation. 4,479,429, Cl. 101-38.00A.
Hasegawa, Akira: *See*—
Yamato, Noboru; Hasegawa, Akira; Umeda, Hiroaki; and Suzuki, Mamoru, 4,480,260, Cl. 346-209.000.
Hasegawa, Kiyoharu: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,480,002, Cl. 428-402.200.
Hasegawa, Shumpei; Kishi, Noriyuki; and Koumura, Takashi, to Honda Motor Co., Ltd. Method for controlling engine idling rpm immediately after the start of the engine. 4,479,471, Cl. 123-339.000.
Hashimoto, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Neutral beam injector. 4,480,185, Cl. 250-251.000.
Hashimoto, Masanori; and Wakita, Masaaki, to Kurita Water Industries Ltd. Process for dewatering sludges. 4,479,879, Cl. 210-727.000.
Hashimoto, Takaaki, to Nippon Kogaku K.K. Method and apparatus for preventing generation of false color signals in color television cameras. 4,480,266, Cl. 358-43.000.
Hashimoto, Yasuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic disk memory track change servo. 4,480,279, Cl. 360-78.000.
Hasler, Barbara: *See*—
Beinvogl, Willy; and Hasler, Barbara, 4,479,850, Cl. 156-643.000.
Hatakoshi, Makoto: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Hatakoshi, Makoto; Yano, Toshihiko; and Itaya, Nobushige, 4,480,118, Cl. 560-8.000.
Hattori, Hirotsugu; and Kuwagata, Masahiro, to Matsushita Electronics Corporation. Contact structure for a semiconductor substrate on a mounting body. 4,480,261, Cl. 357-71.000.
Haushalter, Frederick W.; Coughlin, Stanley J.; and Pervaiz, Khalid, to United Aircraft Products, Inc. Braze fixture and method of using. 4,480,165, Cl. 219-85.00R.
Hawkins, Ronald G.; and Muniak, John E., to Aluminum Company of America. Lightweight frame-type elastomer damping spacer. 4,480,149, Cl. 174-42.000.
Hayakawa, Fukuichiro: *See*—
Suzuki, Norimoto; and Hayakawa, Fukuichiro, 4,479,995, Cl. 428-203.000.
Hayase, Shuzi; and Onishi, Yasunobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Photo-curable epoxy resin composition. 4,479,860, Cl. 204-159.110.
Hayashi, Masaki; Shuto, Katsuhiko; and Iijima, Yoshitsugu, to Ono Pharmaceutical Co., Ltd. Composition containing $PGI_2$ analogs stabilized. 4,479,944, Cl. 424-180.000.
Hayashi, Masaki; Konishi, Yoshitaka; and Arai, Yoshinobu, to Ono Pharmaceutical Company, Ltd. 6,9-Methano-PGI2 analogues. 4,479,966, Cl. 424-305.000.
Hayes, Kenneth W. Method and apparatus for channelling air through a motorcycle fairing. 4,479,676, Cl. 296-78.100.
Haynes, Richard; Jackson, Anna M.; and Zierold, Martin K., to AT&T Technologies, Inc. Solvent treatment in the separation of palladium and/or gold from other platinum group and base metals. 4,479,922, Cl. 423-22.000.
Heberling, Allan V.: *See*—
Kellogg, Walter J.; and Heberling, Allan V., 4,480,161, Cl. 200-144.00R.
Hediger, Matthias. Method and apparatus for preparative gel electrophoresis. 4,479,861, Cl. 204-180.00G.
Hedlund Manufacturing Co., Inc.: *See*—
Martin, Mervin G., 4,479,608, Cl. 239-7.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Heat resistant vinyl ester resin composition. 4,480,077, Cl. 525-530.000.
Heidelberger Druckmaschinen AG: *See*—
Pollich, Gerhard, 4,479,645, Cl. 271-183.000.
Heidman, William A., Jr. Alarm systems for automotive vehicles. 4,480,249, Cl. 340-63.000.
Heinemann, Fritz: *See*—
Marschner, Heinz; Heinemann, Fritz; and Marsland, George, 4,479,403, Cl. 74-640.000.
Heinonen, Ahti. Scrubbing means. 4,479,278, Cl. 15-120.00A.
Heisig, Rolf: *See*—
Bachler, Werner; and Heisig, Rolf, 4,479,360, Cl. 62-55.500.
Heisler, Michael G.: *See*—
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.
Heitkamper, Peter; Fauss, Rudolf; Findeisen, Kurt; Penninger, Stefan; and Scholl, Hans-Joachim, to Bayer Aktiengesellschaft. Process for the preparation of urethanes. 4,480,110, Cl. 549-467.000.
Hendrich, John H. Folded building module and method of assembly. 4,479,333, Cl. 52-70.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Rutzen, Horst, 4,480,126, Cl. 564-292.000.
Henningson, Tommy: *See*—
Schaefer, Louis F.; Kovattana, Termpoon; and Henningson, Tommy, 4,480,179, Cl. 235-473.000.
Henschel, Claude, to Allied Corporation. Homogeneous, ductile brazing foils. 4,480,016, Cl. 428-678.000.
Hepworth, Paul: *See*—
Scott, Norman; and Hepworth, Paul, 4,480,139, Cl. 568-680.000.
Herdeg, Donald F.: *See*—
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,479,446, Cl. 112-121.120.
Herm, Jurgen: *See*—
Fernandez, Jose ; Herm, Jurgen; Krakow, Heinz; Tomsen, Harald; and Wortmann, Ernst, deceased, 4,479,602, Cl. 228-48.000.
Herman, Richard G.: *See*—
Klier, Kamil; Herman, Richard G.; and Vedage, Gamini A., 4,480,131, Cl. 564-480.000.
Herold, Wolf-Dietrich; Grimm-Lenz, Rainer; and Burger, Bernd, to ESPE Fabrik pharmazeutischer Praparate GmbH. Dispenser for metering dental compositions. 4,479,781, Cl. 433-90.000.
Hersom, Albert C.; and Wright, Kenneth W., to Societe d'Assistance Technique Pour Produits Nestle S.A. Piston filler. 4,479,758, Cl. 417-388.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Process for inducing hypnosis. 4,479,959, Cl. 424-269.000.
Hettinger, William P., Jr.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,480,047, Cl. 502-65.000.
Hewlett-Packard Company: *See*—
Batey, Robert M.; and Becker, James D., 4,480,276, Cl. 360-46.000.
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,480,317, Cl. 364-900.000.
Huffman, John W., 4,480,289, Cl. 361-403.000.
Kruger, William P.; and Vaught, John L., 4,480,259, Cl. 346-140.00R.
Lubin, Donald L.; Uebbing, John; Shipley, Donald A.; and Sun, Rickson, 4,479,696, Cl. 350-96.200.
Watson, Robert E.; Walden, Jack M.; and Near, Charles W., 4,480,305, Cl. 364-200.000.
Hickey, Christopher W.: *See*—
Morgan, Hugh W.; Daniel, Roy M.; Cowan, Donald A.; and Hickey, Christopher W., 4,480,036, Cl. 435-220.000.
Hickling, Robert L., to Fairchild Camera & Instrument Corp. Dynamically controllable addressing in automatic test equipment. 4,480,315, Cl. 364-900.000.
Higashiguchi, Teruaki; Nakatani, Kaname; and Miyakawa, Nobuhiro, to Mita Industrial Co., Ltd. Electrophotographic photosensitive material. 4,480,019, Cl. 430-58.000.
Hill, Bernhard, to U.S. Philips Corporation. Optical printer comprising light switching elements. 4,480,257, Cl. 346-107.00R.
Hill, John B.: *See*—
Dryden, Hugh L.; and Hill, John B., 4,480,112, Cl. 549-478.000.
Hill, John P.: *See*—
Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, 4,480,217, Cl. 318-618.000.
Hinz, Lorne C.; and Whiting, David R., to Northern Telecom Limited. Input protection circuits for integrated circuit devices. 4,480,196, Cl. 307-200.00A.
Hiratani, Hajime: *See*—
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, 4,479,937, Cl. 424-99.000.
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, to Eisai Co., Ltd. Piperazine substituted carboxamide derivatives, compositions and method of use. 4,479,954, Cl. 424-251.000.
Hirota, Hajime; and Watanabe, Hiroshi, to Kao Corporation. Shampoo composition containing phosphoric acid ester and organic silicon derivative. 4,479,893, Cl. 252-542.000.
Hitachi Koki Company Limited: *See*—
Nakano, Hiroshige; Kobayashi, Tsuneki; and Katagiri, Shigenobu, 4,479,430, Cl. 101-93.140.
Hitachi, Ltd.: *See*—
Aiki, Kunio; and Ojima, Masahiro, 4,480,325, Cl. 369-122.000.
Hotta, Atsuo; and Kato, Yukio, 4,480,319, Cl. 365-155.000.
Isakozawa, Shigeto; and Kuboroe, Morioki, 4,480,220, Cl. 324-71.300.

Mukoh, Akio; Kitamura, Teruo; Kaneko, Masaharu; and Ozawa, Tetsuo, 4,479,885, Cl. 252-299.620.
Muto, Nobuyoshi; Sakai, Keijiro; Matsuda, Yasuo; and Nandoh, Kenji, 4,480,299, Cl. 363-41.000.
Osawa, Michitaka; and Maekawa, Hitoshi, 4,480,268, Cl. 358-164.000.
Otsubo, Toru; Aiuchi, Susumu; and Kamimura, Takashi, 4,479,848, Cl. 156-626.000.
Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, 4,480,017, Cl. 429-38.000.
Yamada, Jun, 4,480,237, Cl. 333-193.000.

Hitachi Maxell, Ltd.: *See*—
Togawa, Fumio; Karashima, Takato; and Zaitsu, Hiroshi, 4,480,004, Cl. 428-329.000.

Hnatowich, D. ald J., to University of Massachusetts, Trustees of the. Amines coupled wth dicyclic dianhydrides capable of being radiolabeled product. 4,479,930, Cl. 424-1.100.

Hochtemperatur-Reaktorbau GmbH.: *See*—
Schoening, Josef; and Schwiers, Hans-Georg, 4,479,336, Cl. 52-223.00R.

Hoda, Syed N.; and Olszewski, Anthony R., to Corning Glass Works. Mica-resin composite material. 4,480,060, Cl. 523-466.000.

Hodakowski, Leonard E.; and Bushey, Dean F., to Union Carbide Corporation. Phosphorus esters of amidoximes, and compositions for and methods of controlling insects using them. 4,479,946, Cl. 424-200.000.

Hoechst Aktiengesellschaft: *See*—
Arpe, Hans-Jurgen; and Litterer, Heinz, 4,480,128, Cl. 564-424.000.
Farronato, Silvestro; and Gazzea, Sergio, 4,480,008, Cl. 428-425.800.
Lal, Bansi; D'Sa, Adolf; Dohadwalla, Alihussein N.; de Souza, Noel J.; and Dornauer, Horst, 4,479,948, Cl. 424-248.400.
Schafer, Helmut; and Unger, Manfred, 4,479,996, Cl. 428-212.000.
von Plessen, Helmold; Gradl, Reinhard; and Schimmel, Gunther, 4,479,924, Cl. 423-321.00R.

Hoeppel, Raymond W. Apparatus for safely generating and dispensing a gas. 4,479,918, Cl. 422-112.000.

Hoffman, Kevin R.: *See*—
Doehler, Joachim; Hoffman, Kevin R.; Laarman, Timothy D.; DiDio, Gary M.; and McDonough, Therese, 4,479,455, Cl. 118-718.000.

Hohmann, Wolfgang, to Blendax-Werke R. Schneider GmbH & Co. Process for the production of silver-tin master alloys for dental amalgams. 4,479,823, Cl. 75-0.50R.

Holben, Clair D., to Coca-Cola Company, The. Balanced pressure coupling. 4,479,520, Cl. 141-1.000.

Holcomb, Dysart E.: *See*—
Sardisco, John B.; Holcomb, Dysart E.; and Drechsel, Erhart K., deceased, 4,479,923, Cl. 423-320.000.

Holland, Marion D., to Robbins, Robert E. One-man brake check valve and coupler assembly. 4,479,511, Cl. 137-614.200.

Hollaway, Jerrell P. Multiple load switching circuit. 4,480,197, Cl. 307-252.00N.

Holley, Edward J., to General Foods Limited. Gelled milk compositions. 4,479,973, Cl. 426-573.000.

Hollingsworth, William C., to H-Worth, Inc. Method of and apparatus for stuffing foodstuff into a casing. 4,479,283, Cl. 17-49.000.

Holmes, Alan G. Water cooled air conditioning and heating accessory transfer coil kit. 4,479,365, Cl. 62-238.600.

Holmes, David G.; Novak, Richard A.; and McNabb, Jacques Y., to Dominion Engineering Works Limited. Blade configurations for Francis-type turbine runners. 4,479,757, Cl. 416-186.00R.

Holset Engineering Company Limited: *See*—
Miller, Steven M., 4,479,728, Cl. 384-369.000.

Holt, Zedoc A. Crossbow trigger mechanism. 4,479,480, Cl. 124-35.00R.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Shimamura, Haruo, 4,479,472, Cl. 123-340.000.

Honda Motor Co., Ltd.: *See*—
Hasegawa, Shumpei; Kishi, Noriyuki; and Koumura, Takashi, 4,479,471, Cl. 123-339.000.

Honey, Ronald N.; Manwell, Robert E.; Krauss, Clifford J.; and Ybema, Douwe, to Cominco Ltd. Cell top insulator. 4,479,863, Cl. 204-279.000.

Honjo, Satoru: *See*—
Kondo, Syunichi; Sato, Hideo; Honjo, Satoru; and Umehara, Akira, 4,480,020, Cl. 430-81.000.

Hopkins, Jack E.: *See*—
Raden, David T.; and Hopkins, Jack E., 4,479,273, Cl. 4-253.000.

Horey, Leonard I.: *See*—
Jones, Gary D.; Horey, Leonard I.; Kurland, Marvin; and Arnold, Bruce E., 4,479,448, Cl. 112-275.000.

Horiguchi, Satoru: *See*—
Takeuchi, Hideo; Horiguchi, Satoru; and Mizuno, Kenichi, 4,479,435, Cl. 101-382.0MV.

Horike, Akihiro: *See*—
Hagiwara, Tsuneo; and Horike, Akihiro, 4,480,094, Cl. 544-222.000.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; and Horikoshi, Yukio, 4,479,763, Cl. 418-144.000.

Horlenko, Theodore; and Aguilo, Adolfo, to Celanese Corporation. Process for producing methyl formate. 4,480,122, Cl. 560-239.000.

Horsch, Rudolf, to J. I. Case Company. Crawler track transmission system. 4,479,563, Cl. 180-6.700.

Horstmann, Winfried, to Robert Bosch GmbH. System of recording and playback of digitally recorded signals, especially television. 4,480,272, Cl. 360-8.000.

Hoshino, Minoru: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.

Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, to Sony Corporation; and Hosiden Electronics Co. Ltd. Connector. 4,479,686, Cl. 339-17.0LC.

Hosiden Electronics Co. Ltd.: *See*—
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,479,686, Cl. 339-17.0LC.

Hosoda, Junji: *See*—
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.

Hotta, Atsuo; and Kato, Yukio, to Hitachi, Ltd. Emitter coupled flip flop memory with complementary bipolar loads. 4,480,319, Cl. 365-155.000.

Houdaille Industries, Inc.: *See*—
Jelinek, Ross R.; and Reynolds, Robert W., 4,479,397, Cl. 74-89.150.

Howse, Eric R. W., to British Aerospace Public Limited Company. Aircraft door arrangements. 4,479,622, Cl. 244-129.500.

Hoy, John: *See*—
Hyman, William B.; Hoy, John; and van Rensburg, Philippus J., 4,479,968, Cl. 424-330.000.

Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corporation. Sorption fractionation system for olefin separation. 4,479,812, Cl. 55-48.000.

Hsieh, Jih-Han, to Celanese Corporation. Continuous fermentation process and bioconversion-product recovery. 4,480,034, Cl. 435-136.000.

Hsu, John J. Acupuncture needle and needle guide assembly. 4,479,496, Cl. 128-329.00A.

Huang, I-Der: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,480,137, Cl. 568-454.000.

Huber, John R., to TransTechnology Corporation. Method and apparatus for securing a wheeled vehicle. 4,479,746, Cl. 410-21.000.

Hucul, Dennis A.: *See*—
Klun, Robert T.; Murchison, Craig B.; and Hucul, Dennis A., 4,480,121, Cl. 560-206.000.

Huddleston, Robert L.: *See*—
Carr, Clarence A.; Huddleston, Robert L.; and Strickland, Jimmy P., 4,480,304, Cl. 364-200.000.

Hudson, Hal R.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,479,335, Cl. 52-205.000.

Huffman, John W., to Hewlett-Packard Company. Electrical component supported on a support member by a ring mount. 4,480,289, Cl. 361-403.000.

Hug, Paul, to Storage Technology Partners. Alignment apparatus and method for mounting LSI and VLSI packages to a printed circuit board. 4,479,298, Cl. 29-589.000.

Hughes, Allan B.: *See*—
Dear, Terrence A.; and Hughes, Allan B., 4,479,509, Cl. 137-560.000.

Hughes Tool Company: *See*—
Gilbert, Bruce, 4,479,548, Cl. 166-387.000.
Justus, Edgar J., 4,479,551, Cl. 173-119.000.

Hummel, Matt N., to Acra Electric Corporation. Thermostatically controlled electric compressor sump heater having self-contained thermostat. 4,480,174, Cl. 219-331.000.

Humphreys, Michael; and Rolfe, John A., to Electrak International Limited. Electrical distribution system. 4,479,687, Cl. 339-22.00B.

Hung, George H. C. Cycle. 4,479,659, Cl. 280-226.00R.

Hunt, Ann H.; and Merkel, Kurt E., to Eli Lilly and Company. Actaplanin antibiotics. 4,479,897, Cl. 260-112.50R.

Hunter, Frank M. Electrically driven toothbrush. 4,479,516, Cl. 132-84.00R.

Huys, John H.; and Venne, David. Welding electrode. 4,480,167, Cl. 219-119.000.

Hyde, James S.; and Froecisz, Wojciech, to Medical College of Wisconsin Inc., The. Loop-gap resonator network. 4,480,239, Cl. 333-219.000.

Hydril Company: *See*—
Hynes, Joseph H., 4,479,669, Cl. 285-332.300.

Hydro Quebec: *See*—
Fecteau, Gilles, 4,479,299, Cl. 29-623.000.

Hyman, William B.; Hoy, John; and van Rensburg, Philippus J., to Wellcome Foundation Ltd., The. Control of ectoparasitic infestations of pigs. 4,479,968, Cl. 424-330.000.

Hynes, Joseph H., to Hydril Company. Pipe connector with threaded latch screws. 4,479,669, Cl. 285-332.300.

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Ichishima, Fiji; and Onouchi, Takashi, to Showa Denko Kabushiki Kaisha. Alkaline protease and preparation method thereof. 4,480,037, Cl. 435-221.000.

Igarashi, Tadashi: *See*—
Doi, Yoshihiko; Ogasa, Nobuo; Ohtsuka, Akira; and Igarashi, Tadashi, 4,480,013, Cl. 428-616.000.
Ihara Chemical Industry Co., Ltd.: *See*—
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,480,103, Cl. 548-365.000.
Iijima, Yoshitsugu: *See*—
Hayashi, Masaki; Shuto, Katsuhiko; and Iijima, Yoshitsugu, 4,479,944, Cl. 424-180.000.
Ikeda, Daishiro: *See*—
Umezawa, Hamao; Kondo, Shinichi; and Ikeda, Daishiro, 4,479,943, Cl. 424-180.000.
Ilari, Attilio: *See*—
Berti, Alfredo; and Ilari, Attilio, 4,479,741, Cl. 405-163.000.
Illert, Karl: *See*—
Feldmann, Hugo; Illert, Karl; Benz, Willi; and Bohnenkamp, Heinrich, 4,479,374, Cl. 72-236.000.
Illinois Tool Works Inc.: *See*—
Froeb, John W.; and Engstrom, Keith A., 4,479,392, Cl. 73-862.680.
Imanaka, Hiroshi: *See*—
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kobsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.
IMC Magnetics Corp.: *See*—
Manson, Harry G., 4,480,206, Cl. 310-90.000.
Imperial Chemical Industries PLC: *See*—
Belbin, Geoffrey R.; and Cogswell, Frederic N., 4,479,998, Cl. 428-220.000.
Orton, Michael L.; and Spurr, William I., 4,480,079, Cl. 526-301.000.
Scott, Norman; and Hepworth, Paul, 4,480,139, Cl. 568-680.000.
Imprex, Inc.: *See*—
Juday, Thomas W., 4,479,986, Cl. 427-295.000.
Ina, Kenzo: *See*—
Hara, Teruya; and Ina, Kenzo, 4,480,277, Cl. 360-69.000.
Inaba, Hajimu; Nakajima, Seiichiro; Sakakibara, Shinsuke; and Nihei, Ryo, to Fujitsu Fanuc Limited. Hand of an industrial robot. 4,479,673, Cl. 294-88.000.
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Inaba, Hajimu; and Inagaki, Shigemi, 4,479,754, Cl. 414-728.000.
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Mared, Jarl O.; and Mandley, Elwyn G., 4,479,767, Cl. 425-186.000.
Ingersoll, Charles S.; and Schellens, E. Peter. Wood fuel heating apparatus and combustion process. 4,479,481, Cl. 126-76.000.
Ingold Electrodes: *See*—
Beder, Alan H.; and Lai, Nai-Chiu J., 4,479,865, Cl. 204-415.000.
Inland Steel Company: *See*—
Rickels, Lynda M., 4,480,015, Cl. 428-677.000.
Inouye, Alan T.; Wilson, Jeffrey V.; Tausig, Wayne R.; and Roe, Thorndyke, Jr., to United States of America, Navy. Underwater splice for submarine coaxial cable. 4,479,690, Cl. 339-94.00C.
Institut Francais du Petrole: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Dawans, Francois; Marechal, Ernest; and Brigodiot, Maryvonne, 4,480,011, Cl. 428-474.400.
Institut Pasteur: *See*—
Bizzini, Bernard, 4,479,940, Cl. 424-177.000.
Metianu, Tiberius; and Bizzini, Bernard, 4,479,935, Cl. 424-92.000.
Intel Corporation: *See*—
Budde, David L.; Carson, David G.; Johnson, David B.; and Wilde, Doran K., 4,480,307, Cl. 364-200.000.
International Business Machines Corporation: *See*—
Acosta, Raul E.; and Yarmchuk, Edward J., 4,479,980, Cl. 427-10.000.
Appelt, Bernd K.; Schmitt, George P.; and Shipley, John F., 4,479,983, Cl. 427-54.100.
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; and Light, Daivd N., 4,479,852, Cl. 204-1.00T.
Carr, Clarence A.; Huddleston, Robert L.; and Strickland, Jimmy P., 4,480,304, Cl. 364-200.000.
Gazdik, Charles E.; and McBride, Donald G., 4,480,288, Cl. 361-398.000.
Grafe, Robert J.; and Leikam, Gary E., 4,480,308, Cl. 364-200.000.
Hair, Victor D., 4,480,218, Cl. 318-696.000.
McKelley, Charles R., Jr.; Minshall, Leslie A.; and Pirich, Peter J., Jr., 4,480,314, Cl. 364-900.000.
International Flavors & Fragrances Inc.: *See*—
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,480,136, Cl. 568-445.000.
International Harvester Co.: *See*—
Narveson, Brian C.; and Bauer, Frank R., 4,479,399, Cl. 74-339.000.
International Standard Electric Corporation: *See*—
Greenwood, John C., 4,480,162, Cl. 200-181.000.
Thompson, George H. B., 4,480,331, Cl. 372-45.000.
Vance, Ian A. W., 4,480,327, Cl. 370-27.000.
International Standard Electrik Corporation: *See*—
Minks, Werner, 4,480,243, Cl. 335-202.000.
International Telephone and Telegraph Corporation: *See*—
Buonavita, Carlos E., 4,480,252, Cl. 340-632.000.
Piper, Jack R., 4,479,459, Cl. 122-379.000.
Sodini, Gregory L., 4,480,214, Cl. 315-290.000.
Interpace Corporation: *See*—
Nestich, R. Frank; and Preston, Burton L., 4,479,631, Cl. 251-24.000.
Invernizzi, Cesare G., to Energie Froide International SA. Lightning protector assembly. 4,480,146, Cl. 174-3.000.
IPCO Corporation: *See*—
Weissman, Bernard, 4,479,783, Cl. 433-221.000.
Irro, Otmar, to Siemens Aktiengesellschaft. Stuffing cassette with external drive. 4,479,729, Cl. 400-196.100.
Irvin Industries: *See*—
Gulette, Ronald S.; and Lobanoff, Mark, 4,479,677, Cl. 296-98.000.
Irving, Graeme N.: *See*—
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,479,884, Cl. 252-132.000.
Isaacson, Gary S. Acupressure point stimulator device. 4,479,495, Cl. 128-327.000.
Isakozawa, Shigeto; and Kubozoe, Morioki, to Hitachi, Ltd. Electron energy analyzing apparatus. 4,480,220, Cl. 324-71.300.
Ishibashi, Masanori, to Casio Computer Co., Ltd. Tone signal generating apparatus of electronic musical instruments. 4,479,411, Cl. 84-1.010.
Ishida, Tokuzi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Intake passage structure for internal combustion engines. 4,479,470, Cl. 123-308.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,479,369, Cl. 68-5.00C.
Ishii, Hiroyuki, to Sugatsune Industrial Co. Ltd. Stopper for caster. 4,479,566, Cl. 188-1.120.
Ishikawa, Nobuo; and Kitazume, Tomoya, to Ihara Chemical Industry Co., Ltd.; and Daikin Kogyo Co., Ltd. 4-Fluoro-5-oxypyrazole derivatives. 4,480,103, Cl. 548-365.000.
Ishikura, Takashi; Mino, Joji; Sato, Kiyomi; and Nagato, Takaaki, to Tsubakimoto Chain Company. Overhead running carrier. 4,480,157, Cl. 191-34.000.
Ishiyama, Ichiro: *See*—
Kosugi, Masao; Sato, Hiroshi; Takahashi, Kazuo; Ishiyama, Ichiro; and Yabu, Shuichi, 4,479,711, Cl. 355-43.000.
Ishizumi, Kikuo: *See*—
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,480,109, Cl. 549-441.000.
Iso, Tadashi: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,479,949, Cl. 424-248.400.
Itai, Reiichi: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,479,864, Cl. 204-290.00F.
Itami, Teruhiko: *See*—
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,480,258, Cl. 346-135.100.
Itaya, Masahiko: *See*—
Syukuri, Kastuhiro; Haneda, Satoshi; and Itaya, Masahiko, 4,479,709, Cl. 355-15.000.
Itaya, Nobushige: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Hatakoshi, Makoto; Yano, Toshihiko; and Itaya, Nobushige, 4,480,118, Cl. 560-8.000.
Ito, Noboru: *See*—
Mikami, Hitoshi; and Ito, Noboru, 4,479,407, Cl. 81-9.510.
Itou, Kazuhiro: *See*—
Kondou, Masatsune; Itou, Kazuhiro; and Furuta, Tsutomu, 4,480,170, Cl. 219-125.100.
Itse, Daniel C.; and Penterson, Craig A., to Riley Stoker Corporation. Venturi burner nozzle for pulverized coal. 4,479,442, Cl. 110-261.000.
Iversen, Ronald K. Coin-holder. 4,479,502, Cl. 133-1.00A.
Iwakura, Ken: *See*—
Ichijima, Seiji; Ohki, Nobutaka; Satomura, Masato; and Iwakura, Ken, 4,480,052, Cl. 346-208.000.
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, to Santen Pharmaceutical Co., Ltd. Benzothiazoline compounds. 4,479,949, Cl. 424-248.400.
Iwasaki, Jun-ichi, to Takeda Riken Co. Ltd. YIG Tuned filter having coupling loops formed from conductively layered insulated plates. 4,480,238, Cl. 333-202.000.
Izaki, Masataka: *See*—
Okada, Takehiro; Izaki, Masataka; Kajino, Jirou; and Kamiyama, Toshibumi, 4,479,618, Cl. 242-200.000.
J. B. McCoy Construction Co.: *See*—
Kueker, Darrel D., 4,479,554, Cl. 172-311.000.
J. B. Sash & Door Co. Inc.: *See*—
Bertolami, Ugo; and Bertolami, Salvatore, 4,479,331, Cl. 49-404.000.
J. I. Case Company: *See*—
Bennett, Milton C., 4,479,514, Cl. 137-625.630.
Horsch, Rudolf, 4,479,563, Cl. 180-6.700.
Jackson, Anna M.: *See*—
Haynes, Richard; Jackson, Anna M.; and Zierold, Martin K., 4,479,922, Cl. 423-22.000.
Jackson, George R.; and Frick, Donald C., to Arcstart, Inc. Method and apparatus for measuring gas flow. 4,479,377, Cl. 73-3.000.
Jacobsen, Robert S., to Singer Company, The. Internal gate rotary vane fluid meter with improved element geometry. 4,479,384, Cl. 73-253.000.
Jacquet, Maurice, to Valeo. Bent tube and tube assembly, particularly for connecting a heat-exchanger to a circuit. 4,479,668, Cl. 285-137.00R.

Jaeger, Ben E.: *See*—
Shores, Bobby D., 4,479,393, Cl. 73-863.820.
Jaeschke, James R., to Eaton Corporation. Dual mode power transistor. 4,480,201, Cl. 307-570.000.
Jakimas, Donald: *See*—
Jakimas, John A., 4,479,325, Cl. 43-105.000.
Jakimas, John A., to Jakimas, John A.; and Jakimas, Donald. Collapsible crab trap. 4,479,325, Cl. 43-105.000.
James, David R., to James Industries Ltd. Patient support means. 4,479,993, Cl. 428-193.000.
James Industries Ltd.: *See*—
James, David R., 4,479,993, Cl. 428-193.000.
Japan Carlit Co., Ltd., The: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,479,864, Cl. 204-290.00F.
Jasne, Stanley J.: *See*—
Haas, Howard C.; Jasne, Stanley J.; and Moreau, Robert D., 4,480,125, Cl. 564-144.000.
Jelinek, Ross R.; and Reynolds, Robert W., to Houdaille Industries, Inc. Shock/brake unit. 4,479,397, Cl. 74-89.150.
Jencks, Charles L.: *See*—
Castonguay, Roger N.; and Jencks, Charles L., 4,480,242, Cl. 335-194.000.
Jennings, Gordon B. Wall outlet lock apparatus. 4,479,688, Cl. 339-37.000.
Jensen, Kai, to Raytheon Company. Module retainer apparatus. 4,480,287, Cl. 361-388.000.
Jermansen, Torris G.: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,480,137, Cl. 568-454/300.
Jermyn, Arthur C. Contact lens inserter. 4,479,672, Cl. 294-1.0CA.
Jewell, Linda M., to Eastman Kodak Company. Process for the preparation of alkyl-2-alkoxyimino-3-oxo-4-chlorobutyrates. 4,480,120, Cl. 560-168.000.
Johannes Heidenhain GmbH: *See*—
Nelle, Gunther, 4,479,304, Cl. 33-125.00R.
Nelle, Gunther, 4,479,716, Cl. 356-374.000.
John Goudie Associates, Inc.: *See*—
Alphonse, Everett J.; and Alphonse, Everett, Sr., 4,479,340, Cl. 52-646.000.
Johnson, David B.: *See*—
Budde, David L.; Carson, David G.; Johnson, David B.; and Wilde, Doran K., 4,480,307, Cl. 364-200.000.
Johnson, Everett M.; and Schlinger, Warren G., to Texaco Inc. Apparatus for gasifying coal including a slag trap. 4,479,809, Cl. 48-77.000.
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., to USM Corporation. Sewing machine system having automatic identification and processing of mounted work. 4,479,446, Cl. 112-121.120.
Johnson & Johnson Baby Products Company: *See*—
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,479,836, Cl. 156-164.000.
Johnson, Marland R.; and Nauheimer, Donald J., to Uarco Incorporated. Burster for continuous form stationery. 4,479,597, Cl. 225-100.000.
Johnson, Stuart J.; and Fransson, George E., to Barber-Colman Company. Hobbing machine. 4,479,745, Cl. 409-12.000.
Johnson, Ted C., Jr. Apparatus for loading and unloading railway cars. 4,479,750, Cl. 414-392.000.
Johnson, Thomas H., to Shell Oil Company. Niobium (V) halide/oxide-metal oxide compositions and a process for their preparation. 4,480,049, Cl. 502-231.000.
Johnston, Doyle W.: *See*—
Kalk, Franklin D.; Muchnik, Boris J.; Johnston, Doyle W.; and Spong, Fred W., 4,480,302, Cl. 346-135.100.
Johnston, Garland D.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.
Jonelis, John A. Electrostatic precipatator construction having ladder bar spacers. 4,479,813, Cl. 55-137.000.
Jones, Donald W.: *See*—
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,480,207, Cl. 310-156.000.
Jones, Gary D.; Horey, Leonard I.; Kurland, Marvin; and Arnold, Bruce E., to Singer Company, The. Needle positioning arrangement in an electronically controlled household sewing machine. 4,479,448, Cl. 112-275.000.
Jones, Howard: *See*—
Menard, Paul R.; Jones, Howard; and Suh, John T., 4,479,950, Cl. 424-248.500.
Jones, Raymond N.; Lawson, John M.; and Keil, O'Dell F., to Motorola Inc. Lead frame and method. 4,480,150, Cl. 174-52.0FP.
Jones, Thomas G.: *See*—
Behrmann, William C.; and Jones, Thomas G., 4,479,926, Cl. 423-467.000.
Jones, Thomas M.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr., and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Jones, W. Richard, to Mercury Metal Products, Inc. Clamp for tubing. 4,479,288, Cl. 24-277.000.
JOP Inc.: *See*—
Hammershaimb, Harold U.; and Lomas, David A., 4,479,870, Cl. 208-164.000.
Joyner, Frederick B.: *See*—
Trotter, Jimmy R.; Joyner, Frederick B.; and McConnell, Richard L., 4,480,087, Cl. 528-302.000.
Juday, Thomas W., to Imprex, Inc. Impregnation of metal castings. 4,479,986, Cl. 427-295.000.
Jujo Paper Co., Ltd.: *See*—
Yamato, Noboru; Hasegawa, Akira; Umeda, Hiroaki; and Suzuki, Mamoru, 4,480,260, Cl. 346-209.000.
Julius Montz GmbH: *See*—
Streuber, Hans P., 4,479,909, Cl. 261-97.000.
Julius, Richard F.; and Lund, John C., to S. J. Industries, Inc. Container transport apparatus. 4,479,574, Cl. 198-626.000.
Junker, Erwin. Apparatus for cutting saw teeth into saw blades or saw bands. 4,479,405, Cl. 76-38.000.
Justus, Edgar J., to Hughes Tool Company. Actuator for a hydraulic impact device. 4,479,551, Cl. 173-119.000.
Juul, Peter A., to Ford Aerospace & Communications Corporation. Planar multiple oscillator circuit. 4,480,233, Cl. 331-56.000.
K. S. Macey Machine Company, Inc.: *See*—
Macey, Keith S., 4,479,642, Cl. 270-53.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Kamio, Takenori, 4,479,570, Cl. 192-85.0AA.
Kabushiki Kaisha Kito: *See*—
Maeda, Kazuo, 4,479,635, Cl. 254-350.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Watanabe, Masahiro, 4,479,532, Cl. 165-39.000.
Kabushiki Kaisha Shinsei Industries: *See*—
Fujita, Mituo, 4,479,842, Cl. 156-384.000.
Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Yasui, Yoshiharu; Seiki, Kazuo; Suzuki, Yoshihisa; and Amano, Hisao, 4,479,348, Cl. 57-404.000.
Kahkipuro, Matti; and Makinen, Heimo, to Elevator GmbH. Procedure and means for monitoring the phase sequence in a three-phase network. 4,480,283, Cl. 361-76.000.
Kajino, Jirou: *See*—
Okada, Takehiro; Izaki, Masataka; Kajino, Jirou; and Kamiyama, Toshibumi, 4,479,618, Cl. 242-200.000.
Kakuris, Paul A.: *See*—
Schaaf, Cecil F.; and McIntosh, Russell J., 4,479,740, Cl. 405-30.000.
Kakuta, Toshio: *See*—
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,479,686, Cl. 339-17.0LC.
Kalan, Gary L.: *See*—
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,480,207, Cl. 310-156.000.
Kalfayan, Leonard J.; and Watkins, David R., to Union Oil Company of California. Method for deeper penetrating acidizing of siliceous formations. 4,479,543, Cl. 166-300.000.
Kalk, Franklin D.; Muchnik, Boris J.; Johnston, Doyle W.; and Spong, Fred W., to Storage Technology Corporation. Optical recording media. 4,480,302, Cl. 346-135.100.
Kallok, Michael J., to Medtronic, Inc. Self-regenerating drug administration device. 4,479,796, Cl. 604-93.000.
Kami, Tomohiro: *See*—
Maeda, Masatoshi; Kami, Tomohiro; Kusunoki, Toshio; and Yamamura, Yukio, 4,479,609, Cl. 239-102.000.
Kamimura, Takashi: *See*—
Otsubo, Toru; Aiuchi, Susumu; and Kamimura, Takashi, 4,479,848, Cl. 156-626.000.
Kamio, Takenori, to Kabushiki Kaisha Daikin Seisakusho. Pneumatic clutch for an automobile. 4,479,570, Cl. 192-85.0AA.
Kamiyama, Toshibumi: *See*—
Okada, Takehiro; Izaki, Masataka; Kajino, Jirou; and Kamiyama, Toshibumi, 4,479,618, Cl. 242-200.000.
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, to Japan Carlit Co., Ltd., The. Anode for electrolysis of seawater. 4,479,864, Cl. 204-290.00F.
Kanamaru, Takayoshi, to Toho Seiko Co., Ltd. Cross roller bearing. 4,479,683, Cl. 384-619.000.
Kane, Michael W. Tool for positioning electric outlet boxes. 4,479,639, Cl. 269-6.000.
Kaneko, Eiji: *See*—
Takura, Toshiyasu; Okada, Tsuneaki; and Kaneko, Eiji, 4,480,203, Cl. 310-42.000.
Kaneko, Masaharu: *See*—
Mukoh, Akio; Kitamura, Teruo; Kaneko, Masaharu; and Ozawa, Tetsuo, 4,479,885, Cl. 252-299.620.
Kangyo Denkikiki Kabushiki Kaisha: *See*—
Sudo, Michio; and Miura, Hitoshi, 4,480,248, Cl. 338-32.00R.
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Oxepanes and processes therefor. 4,479,964, Cl. 424-278.000.
Kao Corporation: *See*—
Hirota, Hajime; and Watanabe, Hiroshi, 4,479,893, Cl. 252-542.000.
Kapany, Narinder S.; and Unterleitner, Fred C., to Kaptron, Inc. Fiber optics communications modules. 4,479,697, Cl. 350-96.180.
Kaptron, Inc.: *See*—
Kapany, Narinder S.; and Unterleitner, Fred C., 4,479,697, Cl. 350-96.180.
Karalis, Anastasios J.: *See*—
Longley, Kermit D.; and Karalis, Anastasios J., 4,480,119, Cl. 560-151.000.

Karashima, Takato: *See*—
Togawa, Fumio; Karashima, Takato; and Zaitsu, Hiroshi, 4,480,004, Cl. 428-329.000.
Karl Enghofer Metallwarenfabrik GmbH: *See*—
Enghofer, Klaus, 4,479,703, Cl. 351-123.000.
Karpowycz, Ihor B., to Sun Electric Corporation. Automatic gain control for an infrared source of an automotive emissions analyzer. 4,480,191, Cl. 250-343.000.
Kasei Optonix, Ltd.: *See*—
Miyake, Shusaku; and Miura, Norio, 4,480,189, Cl. 250-337.000.
Kasenga, Anthony F., to GTE Products Corporation. Method of making cerium activated yttrium aluminate phosphor. 4,479,886, Cl. 252-301.40R.
Kashiwada, Toshinobu: *See*—
Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, 4,480,000, Cl. 428-284.000.
Kasprik, Manfred; Mintert, Paul; and Werner, Klaus, to Theodor Heimeier Metallwerk GmbH. Heating valve. 4,479,505, Cl. 137-15.000.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,479,665, Cl. 280-644.000.
Kassai, Kenzou, to Kassai Kabushikikaisha. Mechanism for changing the direction of pusher rod means of a baby carriage. 4,479,665, Cl. 280-644.000.
Katagiri, Shigenobu: *See*—
Nakano, Hiroshige; Kobayashi, Tsuneki; and Katagiri, Shigenobu, 4,479,430, Cl. 101-93.140.
Kato, Kazuo; Watanabe, Yoshikazu; Kumashiro, Kenji; and Shimba, Satoru, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,480,028, Cl. 430-54*.000.
Kato, Yukio: *See*—
Hotta, Atsuo; and Kato, Yukio, 4,480,319, Cl. 365-155.000.
Katz, Lawrence H.: *See*—
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Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.
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Monahan, Russel; and Keating, Kevin J., 4,480,212, Cl. 315-71.000.
Kegel, Robert: *See*—
Kube, Wolfgang; Kegel, Robert; Valentin, Guenter; and Staufer, Dieter, 4,479,768, Cl. 425-192.00R.
Keil, O'Dell F.: *See*—
Jones, Raymond N.; Lawson, John M.; and Keil, O'Dell F., 4,480,150, Cl. 174-52.0FP.
Keiper Recaro GmbH & Co.: *See*—
Kluting, Bernd; and Muhr, Dieter, 4,479,626, Cl. 248-420.000.
Kellogg, Walter J.; and Heberling, Allan V., to Westinghouse Electric Corp. Circuit breaker utilizing improved arc chambers. 4,480,161, Cl. 200-144.00R.
Kelyman, John, Jr., to Beloit Corporation. Apparatus and method for processing bagged refuse. 4,479,581, Cl. 209-3.000.
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Eckert, Theodor; Nolting, Siegfried; and Kemper, Fritz, 4,479,939, Cl. 424-172.000.
Kemper, Reinhard: *See*—
Lotsch, Wolfgang; and Kemper, Reinhard, 4,480,097, Cl. 544-296.000.
Kemps, Josephus M. A.: *See*—
Lansbergen, Gabriel J. T.; and Kemps, Josephus M. A., 4,479,976, Cl. 426-607.000.
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Gilman, Thomas; and Miller, Frank N., 4,479,277, Cl. 15-111.000.
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Nelson, Stephen R., 4,479,875, Cl. 210-519.000.
Keshelava, Viktor V.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.
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Singer, Wayne J., 4,479,492, Cl. 128-132.00D.
Kimoto, Toshifumi: *See*—
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Gilvarg, Charles; and Kingsbury, William D., 4,479,898, Cl. 260-112.50R.
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Kirby, Robert A., to Exxon Production Research Co. Flexible magnetic electrical connector and cable incorporating that connector. 4,479,685, Cl. 339-12.00R.
Kirchoff, Francis D., to Alco Electronic Products, Inc. Sub-miniature three position switch with built-in lever lock. 4,480,159, Cl. 200-42.00T.
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Banik, Gary J.; EerNisse, Errol; Kistler, Walter P.; and Paros, Jerome, 4,479,391, Cl. 73-862.590.
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Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.
Kitazume, Tomoya: *See*—
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,480,103, Cl. 544-365.000.
Kiuchi, Masayoshi; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Exposure time reproducing device. 4,479,707, Cl. 354-426.000.
Kiwior, Denis, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Method and device for forming a filling-yarn reserve for looms. 4,479,518, Cl. 139-443.000.
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Klasek, Ladislav J.: *See*—
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,479,836, Cl. 156-164.000.
Klaus, Siegfried; and Einhaus, Albert, to Peddinghaus, Rolf. Bending mandrel arrangement. 4,479,375, Cl. 72-387.000.
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Kleimenhagen, Gunter, to Krupp Corpoplast Maschinenbau GmbH. Blow molding machine employing rotatably driven wheels. 4,479,772, Cl. 425-526.000.
Klementich, Erich F., to Oil Technology Services. Process of manufacturing and using gauges for verifying threads of tubular members. 4,479,306, Cl. 33-199.00R.
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Klier, Kamil; Herman, Richard G.; and Vedage, Gemini A., to Lehigh University. Process for selective production of di- and tri-alkylamines. 4,480,131, Cl. 564-480.000.
Klimisch, Hans-Joachim: *See*—
Bung, Richard; Giesbrecht, Hartmut; Leuckel, Wolfgang; and Klimisch, Hans-Joachim, 4,479,493, Cl. 128-204.180.
Klun, Robert T.; Murchison, Craig B.; and Hucul, Dennis A., to Dow Chemical Company, The. Preparation of 2-halo-1-alkenes and acrylate esters from hydrocarbon streams. 4,480,121, Cl. 560-206.000.
Kluting, Bernd; and Muhr, Dieter, to Keiper Recaro GmbH & Co. Vehicle seat. 4,479,626, Cl. 248-420.000.
Klynas, Scott S., to Mattel, Inc. Multiple drum pad isolation. 4,479,412, Cl. 84-1.040.
Kmecak, Ronald A.: *See*—
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Kobayashi, Susumu; and Shimojo, Yasuaki, to Terumo Corporation. Medication infusion device. 4,479,797, Cl. 604-153.000.
Kobayashi, Tsuneki: *See*—
Nakano, Hiroshige; Kobayashi, Tsuneki; and Katagiri, Shigenobu, 4,479,430, Cl. 101-93.140.

Kobiella, Robert J., to Signode Corporation. Article strapping method and apparatus. 4,479,834, Cl. 156-73.500.
Koch, Paolo; Mattei, Luciano; and Gerbaz, Giampaolo, to Agip Petroli S.p.A. Dispersing additives for lubricants, and the method for their preparation. 4,479,888, Cl. 252-357.000.
Koch, Robert C.: *See*—
Davis, James A.; and Koch, Robert C., 4,480,066, Cl. 524-439.000.
Koch, Ulrich H.; Williams, Peter C.; and Lutz, Gilbert F., to Whitey Co. High pressure ball valve. 4,479,513, Cl. 137-625.470.
Koehler, Dale R., to United States of America, Energy. Double resonator cantilever accelerometer. 4,479,385, Cl. 73-517.00R.
Koehler, Richard E.; and Webber, John A., to Eli Lilly and Company. Preparation of alkali metal thieno(furo)pyridines. 4,480,098, Cl. 546-114.000.
Koehring GmbH: *See*—
Kuhn, Hans; and Rusen, Jochen, 4,479,550, Cl. 173-112.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Germann, Albrecht J., 4,479,431, Cl. 101-136.000.
Koenigkramer, Rusty E.: *See*—
Ashcraft, Robert W.; and Koenigkramer, Rusty E., 4,480,026, Cl. 430-510.000.
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, to Agfa-Gevaert Aktiengesellschaft. Process and an apparatus for stabilizing free-falling liquid curtains. 4,479,987, Cl. 427-402.000.
Kohlstette, Werner, to Westfalia Separator AG. Centrifuge with a self-emptying drum. 4,479,788, Cl. 494-27.000.
Kohsaka, Masanobu: *See*—
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Koide, Hiroshi; and Sawada, Toshiaki, to Citizen Watch Co., Ltd. Watchcase. 4,479,725, Cl. 368-292.000.
Koltron Corporation: *See*—
Frantzen, John J., 4,479,849, Cl. 156-640.000.
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Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.
Kondo, Shinichi: *See*—
Umezawa, Hamao; Kondo, Shinichi; and Ikeda, Daishiro, 4,479,943, Cl. 424-180.000.
Kondo, Syunichi; Sato, Hideo; Honjo, Satoru; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Polymeric photoconductive sensitized by bis(β-cyano-β-alkoxycarbonylvinyl)benzene. 4,480,020, Cl. 430-81.000.
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-to-fuel ratio correcting arrangement in a fuel supply control system having a feedback loop. 4,479,464, Cl. 123-489.000.
Kondou, Masatsune; Itou, Kazuhiro; and Furuta, Tsutomu, to Toyota Jidosha Kabushiki Kaisha. Arc spot welding equipment. 4,480,170, Cl. 219-125.100.
Konishi, Yoshitaka: *See*—
Hayashi, Masaki; Konishi, Yoshitaka; and Arai, Yoshinobu, 4,479,966, Cl. 424-305.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kato, Kazuo; Watanabe, Yoshikazu; Kumashiro, Kenji; and Shimba, Satoru, 4,480,028, Cl. 430-544.000.
Sawaki, Akira; and Nozaki, Hiromi, 4,480,195, Cl. 307-140.000.
Syukuri, Kastuhiro; Haneda, Satoshi; and Itaya, Masahiko, 4,479,709, Cl. 355-15.000.
Koppel, Richard A. Fishing rod holder/carrier. 4,479,322, Cl. 43-21.200.
Koppers Company, Inc.: *See*—
Leston, Gerd, 4,480,140, Cl. 568-784.000.
Koppl, Georg: *See*—
Blahous, Leopold; and Koppl, Georg, 4,480,193, Cl. 307-19.000.
Korczykowski, Lawrence L.; and Zielinski, Robert J., to Duriron Company, Inc., The. Light controlled apparatus for moving filter press plates. 4,479,873, Cl. 210-91.000.
Kordomenos, Panagiotis I.; Alexander, Delores J.; and Thomson, David M., to Ford Motor Company. Polymeric light stabilizers. 4,480,084, Cl. 528-118.000.
Korell, Donald D.: *See*—
Fries, Bernard J.; Faiks, Frederick S.; and Korell, Donald D., 4,479,679, Cl. 297-300.000.
Korkut, Mehmet D. Bolt lock device and method for bolt locking and unlocking relatively movable parts of a rack and pinion jack-up rig. 4,479,401, Cl. 74-527.000.
Kormoczy, Peter: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Kornmann, Michel; and Talmor, Yehuda, to Battelle Development Corporation. Process for manufacturing an anti-corrosion paint and the paint resulting from that process. 4,479,891, Cl. 252-512.000.
Koshi, Masao: *See*—
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, 4,480,010, Cl. 428-457.000.
Koshino, Yutaka; Oishima, Jiro; Ajima, Takashi; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a semiconductor device using epitaxially regrown protrusion as an alignment marker. 4,479,830, Cl. 148-1.500.
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Koszegi, Bela: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Koumura, Takashi: *See*—
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Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., to Goodyear Tire & Rubber Company, The. Tire dynamic imbalance screening system. 4,479,381, Cl. 73-66.000.
Kovach, Stephen M.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,480,047, Cl. 502-65.000.
Kovacs, Gabor: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Kovalovsky, Oscar. Extendable crank handle. 4,479,616, Cl. 242-84.10J.
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Schaefer, Louis F.; Kovattana, Termpoon; and Henningson, Tommy, 4,480,179, Cl. 235-473.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Kuter, Heinrich, deceased; and Klaar, Jurgen, 4,480,204, Cl. 310-68.00R.
Krakow, Heinz: *See*—
Fernandez, Jose ; Herm, Jurgen; Krakow, Heinz; Tomsen, Harald; and Wortmann, Ernst, deceased, 4,479,602, Cl. 228-48.000.
Krauss, Clifford J.: *See*—
Honey, Ronald N.; Manwell, Robert E.; Krauss, Clifford J.; and Ybema, Douwe, 4,479,863, Cl. 204-279.000.
Kricker, Ralph. System for indicating the direction and net distance travelled by a medium containing a periodic asymmetrical flux pattern. 4,480,224, Cl. 324-207.000.
Kroh, Carl A., to Celotex Corporation, The. Cover member for and method of installing insulation boards. 4,479,339, Cl. 52-468.000.
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., to Michigan Technological University, Board of Control of. Static dropless flake aligner for producing composite wood material. 4,479,428, Cl. 100-210.000.
Kruger, Robert J.: *See*—
Bilstad, Arnold C.; Brown, Richard I.; and Kruger, Robert J., 4,479,760, Cl. 417-395.000.
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Kruger, William P.; and Vaught, John L., to Hewlett-Packard Company. Ink jet printer with bubble driven flexible membrane. 4,480,259, Cl. 346-140.00R.
Krupp Corpoplast Maschinenbau GmbH: *See*—
Kleimenhagen, Gunter, 4,479,772, Cl. 425-526.000.
Kryovacs Scientific Corp.: *See*—
Lam, Calvin K., 4,479,358, Cl. 62-6.000.
Ku, Audrey Y., to Monsanto Company. Preparation of ortho-(alkylthiomethyl) anilines by catalytic sulfilimine rearrangement. 4,480,130, Cl. 564-440.000.
Kube, Wolfgang; Kegel, Robert; Valentin, Guenter; and Staufer, Dieter, to BASF Aktiengesellschaft. Sealable discharge die for thermoplastic. 4,479,768, Cl. 425-192.00R.
Kubnick, Norman R., to Sellstrom Manufacturing Company. Attaching assembly. 4,479,738, Cl. 403-407.000.
Kubozoe, Morioki: *See*—
Isakozawa, Shigeto; and Kubozoe, Morioki, 4,480,220, Cl. 324-71.300.
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Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,479,720, Cl. 366-214.000.
Kuech, Thomas F.: *See*—
McCaldin, James O.; and Kuech, Thomas F., 4,479,847, Cl. 156-624.000.
Kueker, Darrel D., to J. B. McCoy Construction Co. Method and apparatus for mounting and lifting implement extension wings. 4,479,554, Cl. 172-311.000.
Kuhn, Hans; and Rusen, Jochen, to Koehring GmbH. Submerging ramming arrangement. 4,479,550, Cl. 173-112.000.
Kumashiro, Kenji: *See*—
Kato, Kazuo; Watanabe, Yoshikazu; Kumashiro, Kenji; and Shimba, Satoru, 4,480,028, Cl. 430-544.000.
Kummer, Martin E.; Sink, William H.; and Tarlton, James K., to Dana Corporation. Spring means for a clutch. 4,479,569, Cl. 192-70.200.
Kunishige, Tadao: *See*—
Takegawa, Shuji; and Kunishige, Tadao, 4,479,840, Cl. 156-327.000.
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, to Nippon Soken, Inc. Apparatus for indicating the direction of a vehicle with abnormal field sensing circuits. 4,480,226, Cl. 324-247.000.

Kuo, Chung-Ming; and Leonard, Alan P., to Eastman Kodak Company. Process for esterification of cellulose using as the catalyst the combination of sulfuric acid, phosphoric acid and a hindered aliphatic alcohol. 4,480,090, Cl. 536-58.000.

Kurita Water Industries Ltd.: *See*—
Hashimoto, Masanori; and Wakita, Masaaki, 4,479,879, Cl. 210-727.000.

Kuriyama, Shizuo: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.

Kurland, Marvin: *See*—
Jones, Gary D.; Horey, Leonard I.; Kurland, Marvin; and Arnold, Bruce E., 4,479,448, Cl. 112-275.000.

Kurokawa, Takashi; Yoshizawa, Tetsuo; and Nara, Shigeo, to Nippon Telegraph & Telephone Public Corp. Method for production of optical fiber connectors. 4,479,910, Cl. 264-2.500.

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Maeda, Masatoshi; Kami, Tomohiro; Kusunoki, Toshio; and Yamamura, Yukio, 4,479,609, Cl. 239-102.000.

Kuter, Gerda, Marlies Kuter, Albert Kuter, Rudolf Kuter, heirs: *See*—
Kuter, Heinrich, deceased; and Klaar, Jurgen, 4,480,204, Cl. 310-68.00R.

Kuter, Heinrich, deceased (by Kuter, Gerda, Marlies Kuter, Albert Kuter, Rudolf Kuter, heirs); and Klaar, Jurgen, to Kraftwerk Union Aktiengesellschaft. Apparatus for the contactless and brushless transmission of measuring and control signals. 4,480,204, Cl. 310-68.00R.

Kutnyak, Thomas A.; and Campbell, Arthur R., to Automation Industries, Inc. Apparatus and method for forming wire reinforced helically fabricated tubing. 4,479,835, Cl. 156-143.000.

Kuwagata, Masahiro: *See*—
Hattori, Hirotsugu; and Kuwagata, Masahiro, 4,480,261, Cl. 357-71.000.

Kvita, Vratislav: *See*—
Fischer, Walter; Kvita, Vratislav; and Zweifel, Hans, 4,480,105, Cl. 549-243.000.

L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See*—
Gougouyan, Yves; and Basseville, Philippe, 4,480,045, Cl. 501-153.000.

La Telemecanique Electrique: *See*—
Barthelemy, Philippe; Baurand, Gilles; and Roussel, Francois, 4,480,194, Cl. 307-132.00E.

La Telephonie Industrielle et Commerciale Telic Alcatel: *See*—
Gass, Raymond, 4,480,198, Cl. 307-269.000.

Laarman, Timothy D.: *See*—
Doehler, Joachim; Hoffman, Kevin R.; Laarman, Timothy D.; DiDio, Gary M.; and McDonough, Therese, 4,479,455, Cl. 118-718.000.

Laber, Carlos A.: *See*—
Brehmer, Kevin E.; Wieser, James B.; and Laber, Carlos A., 4,480,230, Cl. 330-255.000.

Lacy, F. Hilton, Jr., to Mineral & Chemical Resource Co. Production of sulfur from a $H_2S$-bearing gas stream. 4,479,929, Cl. 423-575.000.

LaFleur, Robert H. Jig-saw puzzle work board. 4,479,651, Cl. 273-157.00R.

Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. Alkylated polyalkylenepolyamines, substituted oxo-piperazinyl-triazines. 4,480,092, Cl. 544-113.000.

Lai, Nai-Chiu J.: *See*—
Beder, Alan H.; and Lai, Nai-Chiu J., 4,479,865, Cl. 204-415.000

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See*—
Grenier, Maurice, 4,479,540, Cl. 166-260.000.
Peiloux-Gervais, Pierre, 4,479,359, Cl. 62-52.000.

Lakshminarayanasetty, Kadam S.: *See*—
Mallinson, Richard B.; Mecklenborg, Richard A.; Peters, David L.; and Lakshminarayanasetty, Kadam S., 4,479,784, Cl. 434-43.000.

Lal, Bansi; D'Sa, Adolf; Dohadwalla, Alihussein N.; de Souza, Noel J.; and Dornauer, Horst, to Hoechst Aktiengesellschaft. Triazino(2,1-a)isoquinoline derivatives, compositions and their use as medicaments. 4,479,948, Cl. 424-248.400.

Lalancette, Jean M.; and Hamelin, Hugues, to Societe Nationale de L'Amiante. Light colored and low density mineral filler from magnesium silicate. 4,479,828, Cl. 106-308.00B.

Lam, Calvin K., to Kryovacs Scientific Corp. Miniature cryogenic cooling system with split-phase dual compressor and phase-shifting device. 4,479,358, Cl. 62-6.000.

Lambrecht, Richard M.; and Packer, Samuel, to United States of America, Energy. Method for non-invasive detection of ocular melanoma. 4,479,931, Cl. 424-1.100.

Lameris, Herman J., to Bronswerk K.A.B. B.V. Heat exchanger for a gaseous and a liquid medium. 4,479,536, Cl. 165-145.000.

Landis, William C.; and Nyul, Paul, to RCA Corporation. Light emitting assembly and a method of making same. 4,479,698, Cl. 350-96.200.

Lang, William H.: *See*—
Chang, Clarence D.; and Lang, William H., 4,480,143, Cl. 585-469.000.

Lanier, Ted B.; and Redwine, Ras, V, to RLI, Inc. Evaporative cooler. 4,479,366, Cl. 62-304.000.

Lansbergen, Gabriel J. T.; and Kemps, Josephus M. A., to Lever Brothers Company. Hardened butterfat in margarine fat blends. 4,479,976, Cl. 426-607.000.

Lapatovich, Walter P.; Gibbs, George R.; and Proud, Joseph M., to GTE Laboratories Incorporated. Compact mercury-free fluorescent lamp. 4,480,213, Cl. 315-248.000.

Lapham, Darrell L., to GenCorp Inc. Portable safety device for inflation of truck tires. 4,479,522, Cl. 157-1.000.

Larsen, Borge; Pedersen, Poul K.; and Lauritzen, Georg, to Maskinfabriken Taarup A/S. Loading vehicle for picking up and transporting straw material. 4,479,347, Cl. 56-344.000.

Larson, Craig A.: *See*—
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,770, Cl. 425-503.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,771, Cl. 425-503.000.

Larson, Wayne K., to Minnesota Mining and Manufacturing Company. Amorphous sulfopolyesters. 4,480,085, Cl. 528-295.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,479,956, Cl. 424-253.000.

Lau, Sai-Kwing: *See*—
McIntyre, William H.; Lau, Sai-Kwing; and Singhal, Subhash C., 4,479,868, Cl. 204-426.000.

Lauritzen, Georg: *See*—
Larsen, Borge; Pedersen, Poul K.; and Lauritzen, Georg, 4,479,347, Cl. 56-344.000.

Law, Say-Jong: *See*—
Myles, Arthur; Law, Say-Jong; and Cole, Frank X., 4,480,041, Cl. 436-508.000.

Lawson, John M.: *See*—
Jones, Raymond N.; Lawson, John M.; and Keil, O'Dell F., 4,480,150, Cl. 174-52.0FP.

Lazarus, Harrison; and Nelson, James A. Peritoneal fluid treatment apparatus, package and method. 4,479,792, Cl. 604-29.000.

Leadvaro, Stephen J.: *See*—
Gagnon, Peter R.; Lumia, John J.; Leadvaro, Stephen J.; and Morris, James C., 4,480,296, Cl. 362-211.000.

Lee, Milton L.: *See*—
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., 4,479,380, Cl. 73-61.10C.

Leech, Howard E., to General Motors Corporation. Resistance welding of zinc-coated steel. 4,480,166, Cl. 219-118.000.

Leflar, Charles C.: *See*—
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., 4,480,042, Cl. 436-533.000.

Lehigh University: *See*—
Klier, Kamil; Herman, Richard G.; and Vedage, Gamini A., 4,480,131, Cl. 564-480.000.

Lehrer, Leo K. Reflection densitometer with ellipsoid reflection surface. 4,479,714, Cl. 356-445.000.

Leikam, Gary E.: *See*—
Grafe, Robert J.; and Leikam, Gary E., 4,480,308, Cl. 364-200.000.

Leland Stanford Junior University: *See*—
Newton, Steven A.; Bowers, John E.; and Shaw, Herbert J., 4,479,701, Cl. 350-96.160.

Leng, Svay: *See*—
Nakajima, Hisao; and Leng, Svay, 4,479,615, Cl. 242-68.400.

Lennox Industries, Inc.: *See*—
Cherington, Floyd E., 4,479,482, Cl. 126-99.00R.

Leonard, Alan P.: *See*—
Kuo, Chung-Ming; and Leonard, Alan P., 4,480,090, Cl. 536-58.000.

Leonard Automatics, Inc.: *See*—
Frushtick, Leonard, 4,479,313, Cl. 38-42.000.
Frushtick, Leonard, 4,479,314, Cl. 38-42.000.
Frushtick, Leonard, 4,479,315, Cl. 38-42.000.

Les Condensateurs Sic Safco: *See*—
Constanti, Jean; and Grandadam, Pierre, 4,480,290, Cl. 361-433.000.

Leston, Gerd, to Koppers Company, Inc. Process for alkylating phenolic compounds to produce ortho or para-monoalkylated or 2,4- or 2,6-dialkylated phenols. 4,480,140, Cl. 568-784.000.

Leuckel, Wolfgang: *See*—
Bung, Richard; Giesbrecht, Hartmut; Leuckel, Wolfgang; and Klimisch, Hans-Joachim, 4,479,493, Cl. 128-204.180.

Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, to Robert Bosch GmbH. Magnetic linear drive. 4,480,202, Cl. 310-12.000.

Lever Brothers Company: *See*—
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,479,884, Cl. 252-132.000.
Lansbergen, Gabriel J. T.; and Kemps, Josephus M. A., 4,479,976, Cl. 426-607.000.
Tai, Ho T., 4,479,881, Cl. 252-8.800.

Levy, Nicha; and Patel, Parbhubhai D., to AT&T Bell Laboratories. Radiation curable multifilament composite. 4,479,984, Cl. 427-54.100.

Lewis, Philip L.: *See*—
Etheridge, Robert E.; and Lewis, Philip L., 4,479,610, Cl. 239-171.000.

Leybold-Heraeus GmbH: *See*—
Bachler, Werner; and Heisig, Rolf, 4,479,360, Cl. 62-55.500.

Liberty Die Casting Company: *See*—
Wernecke, Heinz, 4,479,630, Cl. 249-142.000.

Light, Daivd N.: *See*—
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; and Light, Daivd N., 4,479,852, Cl. 204-1.00T.

Lilje, Kenneth C., to Ethyl Corporation. Reduction of nitroaromatic compounds. 4,479,904, Cl. 260-465.00E.

Linde Aktiengesellschaft: *See*—
Fuchs, Uwe, 4,479,876, Cl. 210-605.000.
Lindner, Otto: *See*—
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.
Linke, Horst: *See*—
Grundken, Dieter; Bruggemann, Reinhold; Linke, Horst; and Redder, Manfred, 4,479,575, Cl. 198-735.000.
Lion Corporation: *See*—
Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, 4,480,000, Cl. 428-284.000.
Litterer, Heinz: *See*—
Arpe, Hans-Jurgen; and Litterer, Heinz, 4,480,128, Cl. 564-424.000.
Livigni, Russell A.: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,480,076, Cl. 525-261.000.
Lo, Young S.; and Taylor, Chandler R., Jr., to A. H. Robins Company, Inc. [2-[(Nitropyridinyl)amino]phenyl]arymethanones. 4,480,100, Cl. 546-307.000.
Lobanoff, Mark: *See*—
Gulette, Ronald S.; and Lobanoff, Mark, 4,479,677, Cl. 296-98.000.
Logie, Frank M.; and Phillips, Ronald, to Lucas Industries Public Limited Company. Stator structure for an electromagnetic device. 4,480,208, Cl. 310-194.000.
Lomas, David A.: *See*—
Hammershaimb, Harold U.; and Lomas, David A., 4,479,870, Cl. 208-164.000.
Long, John G., to Durst (U.K.) Limited. Photographic exposure masks. 4,479,713, Cl. 355-74.00R.
Longley, Kermit D.; and Karalis, Anastasios J. Unsymmetrical sulfosuccinate diesters. 4,480,119, Cl. 560-151.000.
Looney, Catharine E.: *See*—
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., 4,480,042, Cl. 436-533.000.
Lorusso, Michelangelo: *See*—
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Lotsch, Wolfgang; and Kemper, Reinhard, to BASF Aktiengesellschaft. Isoindoline colorants. 4,480,097, Cl. 544-296.000.
Lovasz, Marianna G.: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Lowther, Frank E., to Atlantic Richfield Company. Multiple firing exploding film systems. 4,479,919, Cl. 422-127.000.
Lu, Chin H.; and AuClair, Christopher J., to Xerox Corporation. Toner compositions containing negative charge enhancing additives. 4,480,021, Cl. 430-106.600.
Lubin, Donald L.; Uebbing, John; Shipley, Donald A.; and Sun, Rickson, to Hewlett-Packard Company. Housing for interfacing a semiconductor device with a fiber optic cable. 4,479,696, Cl. 350-96.200.
Lubold, Harvey C., Jr.; and Roberts, Glenn H., to GTE Products Corporation. Phosphor manufacturing process. 4,479,521, Cl. 141-12.000.
Lucas, Donald S.: *See*—
Mustacich, Robert V.; Lucas, Donald S.; and Stone, Roger L., 4,479,795, Cl. 604-53.000.
Lucas Industries Public Limited Company: *See*—
Logie, Frank M.; and Phillips, Ronald, 4,480,208, Cl. 310-194.000.
Lucas, Jean: *See*—
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Lucht, Friedrich. Sail with air envelope and contour shaping parts. 4,479,451, Cl. 114-104.000.
Lucki, Stanley J.: *See*—
Brennan, James A.; Lucki, Stanley J.; and Schoennagel, Hans J., 4,480,145, Cl. 585-640.000.
Luddy, Michael A. G.: *See*—
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A. G., 4,480,042, Cl. 436-533.000.
Luh, Yuhshi: *See*—
Chen, Catherine S. H.; and Luh, Yuhshi, 4,479,894, Cl. 252-8.55D.
Lukezich, Paul J.: *See*—
Wendl, Daniel P.; and Lukezich, Paul J., 4,479,305, Cl. 33-180.0AT.
Lumia, John J.: *See*—
Gagnon, Peter R.; Lumia, John J.; Leadvaro, Stephen J.; and Morris, James C., 4,480,296, Cl. 362-211.000.
Lund, Anders E.: *See*—
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,479,428, Cl. 100-210.000.
Lund, John C.: *See*—
Julius, Richard F.; and Lund, John C., 4,479,574, Cl. 198-626.000.
Lundberg, Robert D.; Peiffer, Dennis G.; and Phillips, Robert R., to Exxon Research & Engineering Co. Polymer compositions based on sulfonated ionomers and amine containing polymers. 4,480,063, Cl. 524-399.000.
Lundberg, Thorsten, to Gotaverken Arendal AB. Floating dock. 4,479,450, Cl. 114-46.000.
Luo, Tatao, to Chevron Research Company. 1-Carbalkoxyalkyl-3-aryloxy-4-(2'-carboxyphenyl)-azetidin-2-ones. 4,479,900, Cl. 260-239.00A.
Lutz, Gilbert F.: *See*—
Koch, Ulrich H.; Williams, Peter C.; and Lutz, Gilbert F., 4,479,513, Cl. 137-625.470.
Luursema, Meerten, to U.S. Philips Corporation. Control circuit for a DC-AC converter. 4,480,300, Cl. 363-134.000.
Lyons, Thomas D.; and McCarney, Gregory J., to Minnesota Mining and Manufacturing Company. Industrial X-ray photothermographic system. 4,480,024, Cl. 430-139.000.
Lyrone Kelsey Industries Ltd.: *See*—
Blatz, Rienhold J., 4,479,634, Cl. 254-133.00R.
M&T Chemicals Inc.: *See*—
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M. W. Kellogg Company, The: *See*—
Petterson, William C.; and Hackemesser, Larry G., 4,479,869, Cl. 208-130.000.
Shires, Philip J.; Cassata, John R.; Mandelik, Bernard G.; and van Dijk, Christiaan P., 4,479,925, Cl. 423-359.000.
Macey, Keith S., to K. S. Macey Machine Company, Inc. Reciprocating stitcher assembly operable along signature path. 4,479,642, Cl. 270-53.000.
Macken, John A. Non contact laser engraving apparatus. 4,480,169, Cl. 219-121.0LH.
Mackenzie, Kathleen M.: *See*—
Eng, Jean L.; and Mackenzie, Kathleen M., 4,479,971, Cl. 426-330.000.
MacPhee, John; and Van Raalte, Peter, to Baldwin-Gegenheimer Corporation. Ink level control. 4,479,433, Cl. 101-364.000.
MacPherson, Edwin J.: *See*—
Santos, Ruben A.; Kipp, William G.; and MacPherson, Edwin J., 4,480,068, Cl. 524-456.000.
Macro Engineering Company: *See*—
Planeta, Mirek, 4,479,766, Cl. 425-72.00R.
Maeda, Kazuo, to Kabushiki Kaisha Kito. Idling device for lever hoist. 4,479,635, Cl. 254-350.000.
Maeda, Masatoshi; Kami, Tomohiro; Kusunoki, Toshio; and Yamamura, Yukio, to Matsushita Electric Works, Ltd. Liquid sprayer. 4,479,609, Cl. 239-102.000.
Maeda, Masaya, to Canon Kabushiki Kaisha. Recording and reproducing apparatus for video signals. 4,480,278, Cl. 360-73.000.
Maekawa, Hitoshi: *See*—
Osawa, Michitaka; and Maekawa, Hitoshi, 4,480,268, Cl. 358-164.000.
Magnepan, Inc.: *See*—
Winey, James M., 4,480,155, Cl. 179-115.5PV.
Magnuson, Roland A.: *See*—
Palazzolo, Faro D.; Magnuson, Roland A.; and Aoki, Earl S., 4,479,568, Cl. 192-67.00R.
Magnusson, Stig E.; Puccini, Sergio E.; and Parikh, Kamal I., to GTE Automatic Electric Inc. Arrangement for digital tone distribution. 4,480,330, Cl. 370-110.200.
Mahal, Mohan S., to Cutter Laboratories, Inc. Flexible container material. 4,479,989, Cl. 428-35.000.
Maier-Laxhuber, Peter. Sorption units and methods for their operation. 4,479,364, Cl. 62-141.000.
Mailer, Werner H.; and Sipe, Henry C., to Genicom Corporation. Friction feed tractor. 4,479,598, Cl. 226-74.000.
Maio, Patrick S.: *See*—
Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., 4,479,588, Cl. 220-416.000.
Mairot, Guy; and Aumard, Jean P., to Terraillon. Weighing apparatus for use as scale for persons. 4,479,562, Cl. 177-256.000.
Major, Clare M.: *See*—
Major, Frederick A., deceased; Woike, Henry M.; and Major, Clare M., executrix, 4,479,667, Cl. 285-39.000.
Major, Clare M., executrix: *See*—
Major, Frederick A., deceased; Woike, Henry M.; and Major, Clare M., executrix, 4,479,667, Cl. 285-39.000.
Major, Frederick A., deceased; Woike, Henry M.; and Major, Clare M., executrix, to Major, Clare M., Executrix for Frederick A. Major. Adjustable standpipe apparatus for evaporative coolers. 4,479,667, Cl. 285-39.000.
Maki, Masami: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.
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Kahkipuro, Matti; and Makinen, Heimo, 4,480,283, Cl. 361-76.000.
Makley, James A.: *See*—
Neuhard, Lance D.; and Makley, James A., 4,479,843, Cl. 156-384.000.
Malakhoff, Alexander, to United States of America, Navy. Method and system for determining effect of underwater explosion on submerged structures. 4,479,378, Cl. 73-12.000.
Mallinson, Richard B.; Mecklenborg, Richard A.; Peters, David L.; and Lakshminarayanasetty, Kadam S., to Singer Company, The. Eye line-of-sight responsive wide angle visual system. 4,479,784, Cl. 434-43.000.
Mallou, Charles B., to Union Carbide Corporation. Use of ethyl silicate as a crosslinker for hydroxylated polymers. 4,480,072, Cl. 525-61.000.
Maloney, James J.: *See*—
Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,479,871, Cl. 208-340.000.
Malyarova, Larisa P.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor

G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.

Manchester, Stephen T., to GTE Products Corporation. Diesel fuel heater and combined filter-heater assembly. 4,479,477, Cl. 123-557.000.

Mandelik, Bernard G.: *See*—
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Mandley, Elwyn G.: *See*—
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Manke, Steven A.: *See*—
Rothgery, Eugene F.; and Manke, Steven A., 4,479,917, Cl. 422-16.000.

Manning, Donald R. Apparatus for the remote closing of fuse circuits. 4,480,244, Cl. 337-171.000.

Manning, John D.: *See*—
Domingorena, Albert A.; Rich, Donald G.; and Manning, John D., 4,479,727, Cl. 374-45.000.

Manning, Kenneth J. R.: *See*—
Rogers, John T.; and Manning, Kenneth J. R., 4,479,620, Cl. 244-75.00R.

Manning, Robert A.; and Wisneski, Thomas P., to Applied Solar Engineering, Inc. Method for utilization of oil field waste brine to develop a salt gradient solar pond. 4,479,486, Cl. 126-415.000.

Manson, Harry G., to IMC Magnetics Corp. Motor having stationary shaft and method of assembling it. 4,480,206, Cl. 310-90.000.

Manwell, Robert E.: *See*—
Honey, Ronald N.; Manwell, Robert E.; Krauss, Clifford J.; and Ybema, Douwe, 4,479,863, Cl. 204-279.000.
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.

Maraghe, Alex; and Opsahl, Allan W., to Boeing Company, The. Spring operated counterbalance hinge assembly for aircraft doors. 4,479,623, Cl. 244-129.500.

Marcinko, Richard M.: *See*—
Ting, Vincent W.; and Marcinko, Richard M., 4,480,058, Cl. 523-404.000.

Marcori, Claudio: *See*—
Rinaldi, Rinaldo; Ghermignari, Alberto; and Marcori, Claudio, 4,479,526, Cl. 160-22.000.

Marechal, Ernest: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Dawans, Francois; Marechal, Ernest; and Brigodiot, Maryvonne, 4,480,011, Cl. 428-474.400.

Mared, Jarl O.; and Mandley, Elwyn G., to Ingenjorsfirman J. Mared AB. Briquetting presses and jack associated with such a press. 4,479,767, Cl. 425-186.000.

Maringer, Robert E., to Allegheny Ludlum Steel Corporation. Strip casting apparatus. 4,479,528, Cl. 164-423.000.

Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, to Texaco Inc. Partial oxidation system. 4,479,810, Cl. 48-86.00R.

Marmac Company, The: *See*—
McCreery, Robert B., 4,479,633, Cl. 254-93.00R.

Marmillion, David J.; and Brush, Robert W., Sr., to Bendix Corporation, The. Coupling nut for an electrical connector. 4,479,689, Cl. 339-89.00M.

Marschner, Heinz; Heinemann, Fritz; and Marsland, George, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Harmonic-drive assembly. 4,479,403, Cl. 74-640.000.

Marsland, George: *See*—
Marschner, Heinz; Heinemann, Fritz; and Marsland, George, 4,479,403, Cl. 74-640.000.

Martin, Cynthia H., to Nalco Chemical Company. Synergistic fungicide/biocide of 2-(thiocyanomethylthio) benzothiazole and bis (trichloromethyl) sulfone. 4,479,961, Cl. 424-270.000.

Martin, Dean: *See*—
Peterson, Dale; and Martin, Dean, 4,479,523, Cl. 144-144.50R.

Martin, Felix M. Intervertebral stabilization implant. 4,479,491, Cl. 128-92.00B.

Martin, Mervin G., to Hedlund Manufacturing Co., Inc. Manure spreader. 4,479,608, Cl. 239-7.000.

Martin, Michael A.; Trenholm, Bruce W.; and Woolley, James G., to United States of America, Navy. Parachute riser assembly. 4,479,624, Cl. 244-152.000.

Martz, Raymond L., to Minerallac Electric Company. Conduit hanger. 4,479,625, Cl. 248-74.100.

Maruido, Hiroki: *See*—
Yano, Tomoyuki; and Maruido, Hiroki, 4,480,316, Cl. 364-900.000.

Masaki, Tatsuo; Nishimoto, Toyoshi; and Masui, Kiyoshi, to Toppan Printing Co., Ltd. Thick film printing method. 4,479,432, Cl. 101-170.000.

Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See*—
Rapp, Peter; and Ritterhoff, Heinrich, 4,479,841, Cl. 156-379.800.

Maskinfabriken Taarup A/S: *See*—
Larsen, Borge; Pedersen, Poul K.; and Lauritzen, Georg, 4,479,347, Cl. 56-344.000.

Massachusetts Institute of Technology: *See*—
Smith, Henry I.; and Geis, Michael W., 4,479,846, Cl. 156-603.000.

Mastain, Pierre; and Pailhes, Alain, to Merlin, Gerin. Digital radiation dosemeter having an optoelectronic transmitter. 4,480,311, Cl. 364-527.000.

Masterson, David C.; and Van Dorn, Warren G., to Exxon Research & Engineering Co. Electric discharge facsimile recording material. 4,479,997, Cl. 428-212.000.

Masuda, Akira: *See*—
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.

Masui, Kiyoshi: *See*—
Masaki, Tatsuo; Nishimoto, Toyoshi; and Masui, Kiyoshi, 4,479,432, Cl. 101-170.000.

Masunaga, Makoto, to Canon Kabushiki Kaisha. Trigger device for electronic flash. 4,479,704, Cl. 354-137.000.

Matburn (Holdings) Limited: *See*—
Briggs, Peter J.; and Brooks, Kenneth J., 4,479,818, Cl. 55-385.00C.

Matec Holding AG: *See*—
Haeseker, Willy; Vignal, Robert; and Ferrand, Guy, 4,479,992, Cl. 428-116.000.

Matkovich, Vlado I.: *See*—
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Matsuda, Hisashi, to Esco Co., Ltd. Mass spectrometer. 4,480,187, Cl. 250-296.000.

Matsuda, Mutsuhide: *See*—
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Matsuda, Yasuo: *See*—
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Matsumoto, Masaaki: *See*—
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Matsumoto, Masataka; and Murata, Toshio, to Citizen Watch Co., Ltd. Water-resisting structure for a watch. 4,479,724, Cl. 368-291.000.

Matsumoto, Muneaki: *See*—
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,480,226, Cl. 324-247.000.

Matsuo, Noritada: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Okada, Takehiro; Izaki, Masataka; Kajino, Jirou; and Kamiyama, Toshibumi, 4,479,618, Cl. 242-200.000.

Matsushita Electric Works, Ltd.: *See*—
Maeda, Masatoshi; Kami, Tomohiro; Kusunoki, Toshio; and Yamamura, Yukio, 4,479,609, Cl. 239-102.000.

Matsushita Electronics Corporation: *See*—
Hattori, Hirotsugu; and Kuwagata, Masahiro, 4,480,261, Cl. 357-71.000.

Mattei, Luciano: *See*—
Koch, Paolo; Mattei, Luciano; and Gerbaz, Giampaolo, 4,479,888, Cl. 252-357.000.

Mattel, Inc.: *See*—
Klynas, Scott S., 4,479,412, Cl. 84-1.040.

Mattson, Richard W.: *See*—
Dudley, Carl K.; and Mattson, Richard W., 4,480,222, Cl. 324-126.000.

Matzuk, Terrance, to Dymax Corporation. Ultrasound transducer and drive system. 4,479,388, Cl. 73-634.000.

Mawer, Eric L.: *See*—
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.

Mayers, Walter T.: *See*—
Felice, Mario J.; and Mayers, Walter T., 4,479,461, Cl. 123-90.650.

Mazenod, Francois P.: *See*—
Whitesides, George M.; and Mazenod, Francois P., 4,480,111, Cl. 549-477.000.

McAlinn, Patrick, to Corning Glass Works. High expansion glass-ceramic articles. 4,480,044, Cl. 501-4.000.

McBride, Donald G.: *See*—
Gazdik, Charles E.; and McBride, Donald G., 4,480,288, Cl. 361-398.000.

McCaldin, James O.; and Kuech, Thomas F., to California Institute of Technology. Equilibrium crystal growth from substrate confined liquid. 4,479,847, Cl. 156-624.000.

McCarney, Gregory J.: *See*—
Lyons, Thomas D.; and McCarney, Gregory J., 4,480,024, Cl. 430-139.000.

McCartney, David B. Drink mixing apparatus. 4,479,719, Cl. 366-130.000.

McClain, Michael J.: *See*—
Robertson, Gerald F.; Pozniak, Donald J.; and McClain, Michael J., 4,479,765, Cl. 417-380.000.

McConnell, Richard L.: *See*—
Trotter, Jimmy R.; Joyner, Frederick B.; and McConnell, Richard L., 4,480,087, Cl. 528-302.000.

McCreery, Robert B., to Marmac Company, The. Telescopic differential column hydraulic cylinder. 4,479,633, Cl. 254-93.00R.

McDonald, Joseph K.; and Merritt, James A., to United States of America, Army. Laser photochemical synthesis of benzene and its derivatives. 4,479,859, Cl. 204-158.00R.

McDonald, Stephen B.: *See*—
Bartimes, George F.; Avery, John L.; Blomquist, Leonard A.; and McDonald, Stephen B., 4,479,644, Cl. 271-107.000.

McDonough, Therese: *See*—
Doehler, Joachim; Hoffman, Kevin R.; Laarman, Timothy D.; DiDio, Gary M.; and McDonough, Therese, 4,479,455, Cl. 118-718.000.

McDougal, Allan R.; and Hale, Robert R., to United States of America, Energy. Power efficiency for very high temperature solar thermal cavity receivers. 4,479,485, Cl. 126-439.000.

McEwen, James A., to Western Clinical Engineering Ltd. Adaptive pneumatic tourniquet. 4,479,494, Cl. 128-327.000.

McGinnis, James L., to Celanese Corporation. Direct hydrogenation of carboxylic acids to alcohol and esters. 4,480,115, Cl. 560-1.000.

McIntire, Ray G.; and Colvette, Douglas. Dolly for an automotive engine. 4,479,632, Cl. 254-3.00B.

McIntosh, Russell J.: *See*—
Schaaf, Cecil F.; and McIntosh, Russell J., 4,479,740, Cl. 405-30.000.

McIntyre, William H.; Lau, Sai-Kwing; and Singhal, Subhash C., to Westinghouse Electric Corp. Gas measuring probe. 4,479,868, Cl. 204-426.000.

McKelley, Charles R., Jr.; Minshall, Leslie A.; and Pirich, Peter J., Jr., to International Business Machines Corporation. Method for optimizing printer response time for a key to print operation. 4,480,314, Cl. 364-900.000.

McLean, Paul D.; Garton, Andrew; Scott, Robert F.; and Gransden, Susan E., to Canadian Patents & Development Limited. Epoxy resin fortifiers based on aromatic amides. 4,480,082, Cl. 528-103.000.

McMahon, Paul E.: *See*—
Buckley, Alan; and McMahon, Paul E., 4,479,999, Cl. 428-245.000.

McNabb, Jacques Y.: *See*—
Holmes, David G.; Novak, Richard A.; and McNabb, Jacques Y., 4,479,757, Cl. 416-186.00R.

McNaughton, John P.; Domenco, Wayne E.; and Vokey, David E., to Norscan Instruments Ltd. Apparatus to monitor electrical cables, including splice joints and the like, for the ingress of moisture. 4,480,251, Cl. 340-604.000.

McNeely, Charles D. Credit card carrier with alarm. 4,480,250, Cl. 340-568.000.

McWhorter, Thomas E.; and Halper, Barry J., to Air Products and Chemicals, Inc. Cryogenic cooling of pneumatically transported solids. 4,479,362, Cl. 62-63.000.

Mead Corporation, The: *See*—
Bean, Harley F.; and Noonan, Daniel T., 4,479,641, Cl. 270-53.000.

Mecklenborg, Richard A.: *See*—
Mallinson, Richard B.; Mecklenborg, Richard A.; Peters, David L.; and Lakshminarayanasetty, Kadam S., 4,479,784, Cl. 434-43.000.

Medical College of Wisconsin Inc., The: *See*—
Hyde, James S.; and Fronciaz, Wojciech, 4,480,239, Cl. 333-219.000.

Medolago Albani, Ludovico: *See*—
Pouchain, Maurizio; and Medolago Albani, Ludovico, 4,479,503, Cl. 134-2.000.

Medtronic, Inc.: *See*—
Kallok, Michael J., 4,479,796, Cl. 604-93.000.
Smits, Karel F. A. A., 4,479,500, Cl. 128-786.000.

Mega Products-und Verpackungsentwicklung Marketing GmbH & Co., KG: *See*—
Rusing, Arnold E.; and von Schuckmann, Alfred, 4,479,592, Cl. 222-319.000.

Meidensha Electric Mfg. Co., Ltd.: *See*—
Ando, Yasuo, 4,479,856, Cl. 204-55.00R.

Meier, Dietmar: *See*—
Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, 4,480,202, Cl. 310-12.000.

Meier, Rolf: *See*—
Grossmann, Horst; Meier, Rolf; and Schmid, Karl, 4,479,555, Cl. 173-171.000.

Meixner, Edwin J., to Borg-Warner Corporation. Transducer for measuring torque and/or speed of rotating shaft. 4,479,390, Cl. 73-862.360.

Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., to General Tire & Rubber Company, The. Flexible thermoplastic vinyl chloride polymers. 4,480,076, Cl. 525-261.000.

Menard, Paul R.; Jones, Howard; and Suh, John T., to USV Pharmaceutical Corporation. Aroylaminoacid disulfides. 4,479,950, Cl. 424-248.500.

Merck & Co., Inc.: *See*—
Christensen, Burton G., 4,479,947, Cl. 424-203.000.
Friedman, Arthur J., 4,479,953, Cl. 424-250.000.
Townsend, Perry J., 4,479,726, Cl. 374-1.000.
Veber, Daniel F.; Boger, Joshua S.; and Bock, Mark G., 4,479,941, Cl. 424-177.000.

Mercury Metal Products, Inc.: *See*—
Jones, W. Richard, 4,479,288, Cl. 24-277.000.

Merk, Wolfgang; and Rink, Karl-Heinz, to Degussa Akteingesellschaft. Use of polycondensation products from acrolein and formaldehyde as biocide. 4,479,820, Cl. 71-67.000.

Merkel, Kurt E.: *See*—
Hunt, Ann H.; and Merkel, Kurt E., 4,479,897, Cl. 260-112.50R.

Merlin, Gerin: *See*—
Mastain, Pierre; and Pailhes, Alain, 4,480,311, Cl. 364-527.000.

Merrill, Stewart H.: *See*—
Alexandrovich, Peter S.; and Merrill, Stewart H., 4,480,022, Cl. 430-119.000.

Merritt, James A.: *See*—
McDonald, Joseph K.; and Merritt, James A., 4,479,859, Cl. 204-158.00R.

Merz, William J. Conveyor system. 4,479,572, Cl. 198-345.000.

Messerschmitt-Bolkow-Blohm G.m.b.H.: *See*—
Bergholz, Helmut, 4,479,621, Cl. 244-117.00R.

Metal Spinners (Ireland) Limited: *See*—
Butterfield, Brian J., 4,480,173, Cl. 219-312.000.

Metianu, Tiberius; and Bizzini, Bernard, to Institut Pasteur. Fractions extracted from aerobic bacteria, endowed with antitumoral, antibacterial and interferon inducing properties, and process for their preparation. 4,479,935, Cl. 424-92.000.

Meunier, Gilles: *See*—
Vio, Lino; and Meunier, Gilles, 4,480,067, Cl. 524-446.000.

Meyer, Jon P.: *See*—
Boockino, Harry G.; and Meyer, Jon P., 4,479,790, Cl. 494-85.000.

Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-Phenylsulfonyl-N'-triazinylureas. 4,479,821, Cl. 71-93.000.

Meyer, Willy, to Ciba-Geigy Corporation. Fluoroalkoxy-aminopyrimidines. 4,480,101, Cl. 544-320.000.

Michaux, David. Wheelbarrow with braking system. 4,479,658, Cl. 280-47.310.

Michel, Helmut: *See*—
Wiedemann, Fritz; Michel, Helmut; Weckerle, Wolfgang; Roesch, Egon; and Strein, Klaus, 4,479,962, Cl. 424-273.00N.

Michigan Technological University, Board of Control of: *See*—
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,479,428, Cl. 100-210.000.

Microdot Inc.: *See*—
Pagel, Paul V., 4,479,747, Cl. 411-8.000.

Microlife Technics, Inc.: *See*—
Vandenbergh, Peter A.; and Gonzalez, Carlos F., 4,479,936, Cl. 424-93.000.

Mid America Tag & Label Company, Inc.: *See*—
Dunsirn, Robert J.; and Dunsirn, Duane R., 4,479,838, Cl. 156-247.000.

Midway Fishing Tool Co.: *See*—
Reed, Lehman T., 4,479,537, Cl. 166-77.000.

Migdal, Ilya. Apparatus for solar water heating. 4,479,487, Cl. 126-422.000.

Mikami, Hitoshi; and Ito, Noboru, to Yazaki Corporation. Method and apparatus for processing insulated wire. 4,479,407, Cl. 81-9.510.

Miklos, Richard L., to Minnesota Mining and Manufacturing Company. Non-dublicable magnetic disk jacket and method of manufacture. 4,479,579, Cl. 206-309.000.

Mikutowski, Michael J. Method and apparatus for cleaning phonograph records. 4,479,281, Cl. 15-303.000.

Miller, Frank N.: *See*—
Gilman, Thomas; and Miller, Frank N., 4,479,277, Cl. 15-111.000.

Miller, Gary A.: *See*—
Callihan, Rudy B.; Goad, Bobby F.; and Miller, Gary A., 4,479,544, Cl. 166-290.000.

Miller, John A.; Anderson, Ralph E.; and Allen, Marvin M., to United Technologies Corporation. Process for fabricating integrally bladed bimetallic rotors. 4,479,293, Cl. 29-156.80R.

Miller, Loren K.: *See*—
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,479,381, Cl. 73-66.000.

Miller, Robert R., II; Small, Charles; and Stothoff, John H., to AT&T Information Systems. Tuning arrangement for interfacing credit card-like device to a reader system. 4,480,178, Cl. 235-380.000.

Miller, Steven M., to Holset Engineering Company Limited. Turbocharger bearing system. 4,479,728, Cl. 384-369.000.

Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., to General Electric Company. Permanent magnet rotor and method of making same. 4,480,207, Cl. 310-156.000.

Milligan, Edward J.; Nauman, Delbert A.; and Quick, Nathaniel R., to AT&T Technologies, Inc. Electrical contact means with gold-nickel alloy overlay. 4,480,014, Cl. 428-672.000.

Minagawa, Shoichi: *See*—
Okamoto, Takeshi; Asai, Ryuichi; and Minagawa, Shoichi, 4,480,209, Cl. 310-313.00B.

Minak, Hans-Peter: *See*—
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.

Minakata, Matsuo: *See*—
Sando, Yoshikazu; Isfiidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,479,369, Cl. 68-5.00C.

Minami, Hidehiro: *See*—
Sone, Kohki; Nagaishi, Hatsuo; Minami, Hidehiro; Okamura, Kenji; and Kitagasaki, Yoshitaka, 4,479,866, Cl. 204-425.000.

Mineral & Chemical Resource Co.: *See*—
Lacy, F. Hilton, Jr., 4,479,929, Cl. 423-575.000.

Minerallac Electric Company: *See*—
Martz, Raymond L., 4,479,625, Cl. 248-74.100.

Minks, Werner, to International Standard Electrik Corporation. Electromagnetic relay. 4,480,243, Cl. 335-202.000.

Minner, Willy: *See*—
Domland, Christoph; and Minner, Willy, 4,479,479, Cl. 123-630.000.

Minnesota Mining and Manufacturing Company: *See*—
Edwards, Donald W.; Russell, Terrance J.; and Williams, Donald J., 4,480,003, Cl. 428-329.000.
Larson, Wayne K., 4,480,085, Cl. 528-295.000.
Lyons, Thomas D.; and McCarney, Gregory J., 4,480,024, Cl. 430-139.000.
Miklos, Richard L., 4,479,579, Cl. 206-309.000.

Mino, Joji: *See*—
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Minshall, Leslie A.: *See*—
McKelley, Charles R., Jr.; Minshall, Leslie A.; and Pirich, Peter J., Jr., 4,480,314, Cl. 364-900.000.
Mintert, Paul: *See*—
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Miquel, Jean: *See*—
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Mistlberger, Bruno: *See*—
Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, 4,479,517, Cl. 139-13.00R.
Mita Industrial Co., Ltd.: *See*—
Higashiguchi, Teruaki; Nakatani, Kaname; and Miyakawa, Nobuhiro, 4,480,019, Cl. 430-58.000.
Mitsubishi Chemical Industries Limited: *See*—
Mukoh, Akio; Kitamura, Teruo; Kaneko, Masaharu; and Ozawa, Tetsuo, 4,479,885, Cl. 252-299.620.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Nomura, Masami, 4,479,565, Cl. 187-29.00R.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Sano, Hironari, 4,480,057, Cl. 523-206.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Yamaoka, Keijiro; and Endo, Hajime, 4,479,352, Cl. 60-659.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,480,002, Cl. 428-402.200.
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.
Mitsuki, Iwao: *See*—
Yoshioka, Satoru; Namekawa, Takumi; and Mitsuki, Iwao, 4,479,730, Cl. 400-208.000.
Mitsuwa Kogyo Co., Ltd.: *See*—
Wakimura, Kakuichi, 4,479,327, Cl. 446-427.000.
Miura, Hitoshi: *See*—
[illegible]ado, Michio; and Miura, Hitoshi, 4,480,248, Cl. 338-32.00R.
Miura, Norio: *See*—
Miyake, Shusaku; and Miura, Norio, 4,480,189, Cl. 250-337.000.
Miyakawa, Nobuhiro: *See*—
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Miyake, Kazutoshi: *See*—
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Miyake, Shusaku; and Miura, Norio, to Kasei Optonix, Ltd. Thermoluminescence dosimeter reader. 4,480,189, Cl. 250-337.000.
Miyao, Fumio: *See*—
Tan, Yoichi; and Miyao, Fumio, 4,480,200, Cl. 307-354.000.
Mize, David L.: *See*—
Bullock, Ralph, 4,479,912, Cl. 264-23.000.
Mizuno, Kenichi: *See*—
Takeuchi, Hideo; Horiguchi, Satoru; and Mizuno, Kenichi, 4,479,435, Cl. 101-382.0MV.
Mizutani, Yoshihisa; and Takasu, Shinichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of fabricating three-dimensional semiconductor devices utilizing $CeO_2$ and ion-implantation. 4,479,297, Cl. 29-571.000.
Mobil Oil Corporation: *See*—
Brennan, James A.; Lucki, Stanley J.; and Schoennagel, Hans J., 4,480,145, Cl. 585-640.000.
Chang, Clarence D.; and Lang, William H., 4,480,143, Cl. 585-469.000.
Chen, Catherine S. H.; and Luh, Yuhshi, 4,479,894, Cl. 252-8.55D.
Chen, Nai Y.; and Walsh, Dennis E., 4,479,804, Cl. 44-1.0SR.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,479,812, Cl. 55-48.000.
Russo, Robert V., 4,480,073, Cl. 525-68.000.
Smith, Fritz A., 4,480,144, Cl. 585-481.000.
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, to Mochida Pharmaceutical Co., Ltd. Apparatus for rotating reaction vessels in inclined posture. 4,479,720, Cl. 366-214.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,479,720, Cl. 366-214.000.
Molex Incorporated: *See*—
Smith, Frank L., Jr., 4,479,691, Cl. 339-59.00M.
Monahan, Russel; and Keating, Kevin J., to Diolight Technology, Inc. Extended life incandescent lamp with self contained diode and reflector. 4,480,212, Cl. 315-71.000.
Monarch Marking Systems, Inc.: *See*—
Neuhard, Lance D.; and Makley, James A., 4,479,843, Cl. 156-384.000.
Monsanto Company: *See*—
Ku, Audrey Y., 4,480,130, Cl. 564-440.000.
Wang, Yun L., 4,480,074, Cl. 525-194.000.
Montorfano, Renzo; and Montorfano, Virginio, to Officina Meccanica Montorfano S.n.c. di Montorfano Virginio e Renzo. Tube bending assembly, particularly for thin wall and small and medium diameter metal tubes. 4,479,373, Cl. 72-158.000.
Montorfano, Virginio: *See*—
Montorfano, Renzo; and Montorfano, Virginio, 4,479,373, Cl. 72-158.000.
Moreau, Robert D.: *See*—
Haas, Howard C.; Jasne, Stanley J.; and Moreau, Robert D., 4,480,125, Cl. 564-144.000.
Morgan, Hugh W.; Daniel, Roy M.; Cowan, Donald A.; and Hickey, Christopher W., to Development Finance Corporation. Proteolytic enzyme. 4,480,036, Cl. 435-220.000.
Mori, Ichiro: *See*—
Tojo, Toru; Mori, Ichiro; and Sano, Shunichi, 4,480,284, Cl. 361-234.000.
Mori, Yoshio: *See*—
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, 4,480,269, Cl. 358-209.000.
Morris, Earl L.; Hafner, Walter V.; and Hahn, Ron T., to Acorn Engineering Company. Vandal-resistant push button electrical switch assembly. 4,480,163, Cl. 200-331.000.
Morris, James C.: *See*—
Gagnon, Peter R.; Lumia, John J.; Leadvaro, Stephen J.; and Morris, James C., 4,480,296, Cl. 362-211.000.
Morris, Lewis R.; Sullivan, Timothy M.; and Sharp, James L. Handlebar mounting for a fairing. 4,479,663, Cl. 280-289.00H.
Morris, Raymond T., to Northern Engineering Industries plc. Discriminator device. 4,480,241, Cl. 335-17.000.
Morse, David L.: *See*—
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, 4,479,819, Cl. 65-30.110.
Moscovich, Ivan. Game with conveyor. 4,479,654, Cl. 273-271.000.
Mosier, Carl E.: *See*—
Ely, Richard I.; and Mosier, Carl E., 4,480,182, Cl. 250-227.000.
Moss, Gilbert G.: *See*—
Sangster, William H.; and Moss, Gilbert G., 4,479,637, Cl. 266-281.000.
Motorola Inc.: *See*—
Davidson, Allen L., 4,480,255, Cl. 343-844.000.
Jones, Raymond N.; Lawson, John M.; and Keil, O'Dell F., 4,480,150, Cl. 174-52.0FP.
Takehara, Shigeru, 4,480,231, Cl. 330-261.000.
Mott, Donna M.: *See*—
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Mourou, Gerard: *See*—
Albrecht, Georg F.; and Mourou, Gerard, 4,480,192, Cl. 250-550.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Thoma, Martin; and Buenger, Paul, 4,479,855, Cl. 204-16.000.
Muchnik, Boris J.: *See*—
Kalk, Franklin D.; Muchnik, Boris J.; Johnston, Doyle W.; and Spong, Fred W., 4,480,302, Cl. 346-135.100.
Mueller, Herbert, to BASF Aktiengesellschaft. Process for the purifying of polytetramethylene ether glycol or corresponding diester. 4,480,124, Cl. 560-248.000.
Muhl, John S.: *See*—
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.
Muhr, Dieter: *See*—
Kluting, Bernd; and Muhr, Dieter, 4,479,626, Cl. 248-420.000.
Mukoh, Akio; Kitamura, Teruo; Kaneko, Masaharu; and Ozawa, Tetsuo, to Hitachi, Ltd.; and Mitsubishi Chemical Industries Limited. Phthalonitrile derivatives and a liquid crystal composition containing the same. 4,479,885, Cl. 252-299.620.
Muller, Luis C. Mechanically controlled sealing rail for door leaf. 4,479,330, Cl. 49-303.000.
Mundie, Craig J.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Mundt, Arnold L.; and Besir, Charles E., to BS&B Safety Systems, Inc. Two-way rupturable pressure relief apparatus. 4,479,587, Cl. 220-89.00A.
Mungin, Halbert: *See*—
Cannady, Daniel L., Jr.; and Mungin, Halbert, 4,480,001, Cl. 428-284.000.
Muniak, John E.: *See*—
Hawkins, Ronald G.; and Muniak, John E., 4,480,149, Cl. 174-42.000.
Murata, Toshio: *See*—
Matsumoto, Masataka; and Murata, Toshio, 4,479,724, Cl. 368-291.000.
Murchison, Craig B.: *See*—
Klun, Robert T.; Murchison, Craig B.; and Hucul, Dennis A., 4,480,121, Cl. 560-206.000.
Musick, Carroll, to Erwin Welding & Machine, Inc. Method and apparatus for manufacturing discrete layered articles from a continuous web. 4,479,295, Cl. 29-417.000.
Mustacich, Robert V.; Lucas, Donald S.; and Stone, Roger L., to Procter & Gamble Company, The. Antimicrobial polymer compositions. 4,479,795, Cl. 604-53.000.
Muto, Nobuyoshi; Sakai, Keijiro; Matsuda, Yasuo; and Nandoh, Kenji, to Hitachi, Ltd. Method of controlling the output voltage of a pulse width modulation inverter. 4,480,299, Cl. 363-41.000.
Myles, Arthur; Law, Say-Jong; and Cole, Frank X., to Collaborative Research, Inc. Use of phosphotriester intermediates for preparation of functionalized liposomes. 4,480,041, Cl. 436-508.000.

Nagaishi, Hatsuo: *See*—
Sone, Kohki; Nagaishi, Hatsuo; Minami, Hidehiro; Okamura, Kenji; and Kitagasaki, Yoshitaka, 4,479,866, Cl. 204-425.000.
Nagamoto, Itsushi, to Nippon Gakki Seizo Kabushiki Kaisha. Wood-type golf club head. 4,479,652, Cl. 273-172.000.
Nagata, Shoji: *See*—
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,480,109, Cl. 549-441.000.
Nagato, Takaaki: *See*—
Ishikura, Takashi; Mino, Joji; Sato, Kiyomi; and Nagato, Takaaki, 4,480,157, Cl. 191-34.000.
Nagel, Dietmar: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,479,326, Cl. 446-23.000.
Naiff, Kenneth L., to General Instrument Corp. Compact ROM with reduced access time. 4,480,320, Cl. 365-189.000.
Nakajima, Fumio, to Citizen Watch Co., Ltd. Motor driving circuits. 4,480,216, Cl. 318-331.000.
Nakajima, Hisao; and Leng, Svay, to Fuji Xerox Co., Ltd. Roll sheet supplying mechanism for a recording device. 4,479,615, Cl. 242-68.400.
Nakajima, Seiichiro: *See*—
Inaba, Hajimu; Nakajima, Seiichiro; Sakakibara, Shinsuke; and Nihei, Ryo, 4,479,673, Cl. 294-88.000.
Nakamura, Mitsuo: *See*—
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.
Nakano, Hiroshige; Kobayashi, Tsuneki; and Katagiri, Shigesobu, to Hitachi Koki Company Limited. System of discriminating the kinds of type carriers. 4,479,430, Cl. 101-93.140.
Nakatani, Kaname: *See*—
Higashiguchi, Teruaki; Nakatani, Kaname; and Miyakawa, Nobuhiro, 4,480,019, Cl. 430-58.000.
Nalco Chemical Company: *See*—
Martin, Cynthia H., 4,479,961, Cl. 424-270.000.
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,479,469, Cl. 123-308.000.
Namekawa, Takumi: *See*—
Yoshioka, Satoru; Namekawa, Takumi; and Mitsuki, Iwao, 4,479,730, Cl. 400-208.000.
Nance, Roy A.; Hartley, William H.; and Caffarel, Alfred J., to United States of America, Energy. Improved multi-directional eddy current inspection test apparatus for detecting flaws in metal articles. 4,480,225, Cl. 324-238.000.
Nandoh, Kenji: *See*—
Muto, Nobuyoshi; Sakai, Keijiro; Matsuda, Yasuo; and Nandoh, Kenji, 4,480,299, Cl. 363-41.000.
Nara, Shigeo: *See*—
Kurokawa, Takashi; Yoshizawa, Tetsuo; and Nara, Shigeo, 4,479,910, Cl. 264-2.500.
Narveson, Brian C.; and Bauer, Frank R., to International Harvester Co. Chip system to monitor and digitally control a multiple clutch transmission. 4,479,399, Cl. 74-339.000.
Natarajan, Kavilipalayam; and Zimmerman, Daniel, to Celanese Corporation. Isocyanate-coupled reinforced oxymethylene polymers. 4,480,071, Cl. 524-593.000.
National Research Development Corporation: *See*—
Ross, Colin F., 4,480,333, Cl. 381-71.000.
National Semiconductor Corporation: *See*—
Brehmer, Kevin E.; Wieser, James B.; and Laber, Carlos A., 4,480,230, Cl. 330-255.000.
National Starch and Chemical Corp.: *See*—
Fernandez, Julio A., 4,479,825, Cl. 106-34.000.
National Steel Corporation: *See*—
Sangster, William H.; and Moss, Gilbert G., 4,479,637, Cl. 266-281.000.
Nauheimer, Donald J.: *See*—
Johnson, Marland R.; and Nauheimer, Donald J., 4,479,597, Cl. 225-100.000.
Nauman, Delbert A.: *See*—
Milligan, Edward J.; Nauman, Delbert A.; and Quick, Nathaniel R., 4,480,014, Cl. 428-672.000.
NCC Engineering, Inc.: *See*—
Carroll, William L., 4,479,424, Cl. 99-502.000.
Near, Charles W.: *See*—
Watson, Robert E.; Walden, Jack M.; and Near, Charles W., 4,480,305, Cl. 364-200.000.
Near Equilibrium Research Associates: *See*—
Oliker, Michael D., 4,479,814, Cl. 55-162.000.
Neil, Iain A., to Barr & Stroud Limited. Afocal refractor telescopes. 4,479,695, Cl. 350-1.300.
Nelle, Gunther, to Johannes Heidenhain GmbH. Fastening element for length measuring device. 4,479,304, Cl. 33-125.00R.
Nelle, Gunther, to Johannes Heidenhain GmbH. Incremental measuring instrument. 4,479,716, Cl. 356-374.000.
Nelson, James A.: *See*—
Lazarus, Harrison; and Nelson, James A., 4,479,792, Cl. 604-29.000.
Nelson, John A.: *See*—
Stout, Gregg W.; and Nelson, John A., 4,479,556, Cl. 175-4.600.
Nelson, Merritt J.: *See*—
Evans, Frank C.; and Nelson, Merritt J., 4,479,736, Cl. 403-287.000.
Nelson, Stephen R., to Kerr-McGee Refining Corporation. Inlet distributor for liquid-liquid separators. 4,479,875, Cl. 210-519.000.
Nelson, Stewart C., to Automatic Orange Juicer Corp. Fruit cutter and juicer. 4,479,425, Cl. 99-507.000.
Neri, Carlo: *See*—
Esposito, Antonio; Neri, Carlo; and Buonomo, Franco, 4,480,135, Cl. 568-385.000.
Nestich, R. Frank; and Preston, Burton L., to Interpace Corporation. Hydraulically balanced valve mechanism. 4,479,631, Cl. 251-24.000.
Neuhard, Lance D.; and Makley, James A., to Monarch Marking Systems, Inc. Labeler. 4,479,843, Cl. 156-384.000.
Neuhierl, Hermann. Toy-racing express motor road. 4,479,650, Cl. 273-86.00B.
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr. Illuminated playball. 4,479,649, Cl. 273-61.00R.
Newcomb, Nelson F., Jr.: *See*—
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr., 4,479,649, Cl. 273-61.00R.
Newton, Charles L.; and Fuini, Dennis L., to Air Products and Chemicals, Inc. Recovery of power from vaporization of liquefied natural gas. 4,479,350, Cl. 60-655.000.
Newton, Steven A.; Bowers, John E.; and Shaw, Herbert J., to Leland Stanford Junior University. Dual coupler fiber optic recirculating memory. 4,479,701, Cl. 350-96.160.
Nichols, Jimmy B., to Emerson Electric Co. Fluid pressure operated valve. 4,479,507, Cl. 137-220.000.
Nicolas, Denise: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Dawans, Francois; Marechal, Ernest; and Brigodiot, Maryvonne, 4,480,011, Cl. 428-474.400.
Niconchuk, Alec W., to North Shore Laboratories Corporation. Insertion tool for cord-type tubeless tire repairing. 4,479,408, Cl. 81-15.700.
Nido, Ltd.: *See*—
Yamada, Shiro, 4,479,291, Cl. 128-330.000.
Nifco Inc.: *See*—
Hara, Kunio, 4,479,601, Cl. 227-130.000.
Hara, Kunio, 4,480,247, Cl. 337-407.000.
Nihei, Ryo: *See*—
Inaba, Hajimu; Nakajima, Seiichiro; Sakakibara, Shinsuke; and Nihei, Ryo, 4,479,673, Cl. 294-88.000.
Nilsson, Kenth; and Schulte, Rolf, to Siemens Aktiengesellschaft. Method for producing a lyophobic layer. 4,479,982, Cl. 427-41.000.
Ninomiya, Masakazu: *See*—
Suzuki, Atsushi; and Ninomiya, Masakazu, 4,479,476, Cl. 123-478.000.
Nipko, Jack A.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,479,335, Cl. 52-205.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nagamoto, Itsushi, 4,479,652, Cl. 273-172.000.
Nippon Kogaku K.K.: *See*—
Hashimoto, Takaaki, 4,480,266, Cl. 358-43.000.
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, 4,480,269, Cl. 358-209.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; and Horikoshi, Yukio, 4,479,7u3, Cl. 418-144.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Suzuki, Masayuki, 4,479,681, Cl. 308-5.00R.
Nippon Soken, Inc.: *See*—
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,480,226, Cl. 324-247.000.
Nippon Telegraph & Telephone Public Corp.: *See*—
Kurokawa, Takashi; Yoshizawa, Tetsuo; and Nara, Shigeo, 4,479,910, Cl. 264-2.500.
Takahashi, Kenzo; and Sakamoto, Takashi, 4,480,156, Cl. 179-170.200.
Nippondenso Co., Ltd.: *See*—
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.
Suzuki, Atsushi; and Ninomiya, Masakazu, 4,479,476, Cl. 123-478.000.
Nishimoto, Toyoshi: *See*—
Masaki, Tatsuo; Nishimoto, Toyoshi; and Masui, Kiyoshi, 4,479,432, Cl. 101-170.000.
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, to Fuji Xerox Co., Ltd. Magnetic recording medium. 4,480,258, Cl. 346-135.100.
Nisizawa, Jun-ichi; and Fukase, Masaaki, to Semiconductor Research Foundation. Vapor growth with monitoring. 4,479,845, Cl. 156-601.000.
Nissan Motor Company, Limited: *See*—
Sekimoto, Hironobu; and Sato, Norio, 4,479,294, Cl. 29-159.200.
Sone, Kohki; Nagaishi, Hatsuo; Minami, Hidehiro; Okamura, Kenji; and Kitagasaki, Yoshitaka, 4,479,866, Cl. 204-425.000.
Noda, Takaaki: *See*—
Echigo, Ryozo; Noda, Takaaki; Kinto, Koichiro; and Sato, Kenjiro, 4,479,535, Cl. 165-142.000.
Nolan, Daniel A.: *See*—
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, 4,479,819, Cl. 65-30.110.
Nolting, Siegfried: *See*—
Eckert, Theodor; Nolting, Siegfried; and Kemper, Fritz, 4,479,939, Cl. 424-172.000.
Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for a.c. elevator. 4,479,565, Cl. 187-29.00R.
Noonan, Daniel T.: *See*—
Bean, Harley F.; and Noonan, Daniel T., 4,479,641, Cl. 270-53.000.

Nord, Keith W., to Ex-Cell-O Corporation. Corrugated box forming, loading and sealing machine. 4,479,345, Cl. 53-564.000.
Nordmeyer, Robert, to Ski Tote USA. Device for carrying elongated items. 4,479,674, Cl. 294-147.000.
Norimatsu, Hideaki: *See*—
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.
Norscan Instruments Ltd.: *See*—
McNaughton, John P.; Domenco, Wayne E.; and Vokey, David E., 4,480,251, Cl. 340-604.000.
North Shore Laboratories Corporation: *See*—
Niconchuk, Alec W., 4,479,408, Cl. 81-15.700.
Northern Engineering Industries plc: *See*—
Morris, Raymond T., 4,480,241, Cl. 335-17.000.
Northern Telecom Limited: *See*—
Hinz, Lorne C.; and Whiting, David R., 4,480,196, Cl. 307-200.00A.
Norwood, Joseph E., Sr. Automotive oil filter precharging arrangement. 4,479,468, Cl. 123-196.00S.
Novak, Richard A.: *See*—
Holmes, David G.; Novak, Richard A.; and McNabb, Jacques Y., 4,479,757, Cl. 416-186.00R.
Novinger, William. Insulated clothing and other like fabric products. 4,479,270, Cl. 2-69.000.
Novo, Juan. Saxophone neck grease plug. 4,479,413, Cl. 84-329.000.
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., to Brigham Young University. Open-tubular supercritical fluid chromatography. 4,479,380, Cl. 73-61.10C.
Nozaki, Hiromi: *See*—
Sawaki, Akira; and Nozaki, Hiromi, 4,480,195, Cl. 307-140.000.
Numata, Koji: *See*—
Kano, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,480,226, Cl. 324-247.000.
Nymann, Svend. Automatic brake control for rotary electric tools. 4,480,205, Cl. 310-77.000.
Nyul, Paul: *See*—
Landis, William C.; and Nyul, Paul, 4,479,698, Cl. 350-96.200.
O'Connor, James M.: *See*—
Rosin, Michael L.; O'Connor, James M.; Schnabel, Wilhelm J.; and Early, Robert M., 4,480,081, Cl. 528-49.000.
Officina Meccanica Montorfano S.n.c. di Montorfano Virginio e Renzo: *See*—
Montorfano, Renzo; and Montorfano, Virginio, 4,479,373, Cl. 72-158.000.
Ogasa, Nobuo: *See*—
Doi, Yoshihiko; Ogasa, Nobuo; Ohtsuka, Akira; and Igarashi, Tadashi, 4,480,013, Cl. 428-616.000.
Ogura, Takashi. Method of and apparatus for producing highly humid air. 4,479,907, Cl. 261-18.00A.
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, to Sumitomo Chemical Company, Limited. Process for producing threo-3-(3,4-dihydroxyphenyl)serine. 4,480,109, Cl. 549-441.000.
Ohki, Nobutaka: *See*—
Ichijima, Seiji; Ohki, Nobutaka; Satomura, Masato; and Iwakura, Ken, 4,480,052, Cl. 346-208.000.
Ohrendorf, Johannes; and Wagner, Harald, to Elektro-Mechanik GmbH. Continuous control valve with rotary or axial slide. 4,479,512, Cl. 137-625.170.
Ohshima, Jiro: *See*—
Koshino, Yutaka; Ohshima, Jiro; Ajima, Takashi; and Yonezawa, Toshio, 4,479,830, Cl. 148-1.500.
Ohtsuka, Akira: *See*—
Doi, Yoshihiko; Ogasa, Nobuo; Ohtsuka, Akira; and Igarashi, Tadashi, 4,480,013, Cl. 428-616.000.
Oil Technology Services: *See*—
Klementich, Erich F., 4,479,306, Cl. 33-199.00R.
Ojima, Masahiro: *See*—
Aiki, Kunio; and Ojima, Masahiro, 4,480,325, Cl. 369-122.000.
Okabe, Sigeru: *See*—
Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, 4,480,017, Cl. 429-38.000.
Okada, Hideo: *See*—
Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, 4,480,017, Cl. 429-38.000.
Okada, Junya: *See*—
Suzuki, Takashi; Okada, Junya; and Sawada, Hidekazu, 4,480,033, Cl. 435-124.000.
Okada, Takehiro; Izaki, Masataka; Kajino, Jirou; and Kamiyama, Toshibumi, to Matsushita Electric Industrial Co., Ltd. Tape cassette adapter. 4,479,618, Cl. 242-200.000.
Okada, Tsuneaki: *See*—
Takura, Toshiyasu; Okada, Tsuneaki; and Kaneko, Eiji, 4,480,203, Cl. 310-42.000.
Okamoto, Takeshi; Asai, Ryuichi; and Minagawa, Shoichi, to Clarion Co., Ltd. Surface acoustic wave device having a specified crystalline orientation. 4,480,209, Cl. 310-313.00B.
Okamura, Kenji: *See*—
Sone, Kohki; Nagaishi, Hatsuo; Minami, Hidehiro; Okamura, Kenji; and Kitaganaki, Yoshitaka, 4,479,866, Cl. 204-425.000.
Okuhara, Hiroo: *See*—
Takada, Keisuke; and Okuhara, Hiroo, 4,480,303, Cl. 364-138.000.
Okumura, Shuichi; and Satoh, Yutaka, to Toyo Kizai Kabushiki Kaisha. Rail fastening device. 4,479,607, Cl. 238-349.000.
Olenfalk, Lars, to Alfa-Laval AB. Method of closing, compressing and opening of presses for membrane filters and apparatus for carrying out the method. 4,479,426, Cl. 100-37.000.
Oliker, Michael D., to Near Equilibrium Research Associates. Recirculation regeneration. 4,479,814, Cl. 55-162.000.
Olin Corporation: *See*—
Bilsbury, Stephen J., 4,479,438, Cl. 102-454.000.
Butt, Sheldon H., 4,480,262, Cl. 357-74.000.
Pryor, Michael J.; and Winter, Joseph, 4,479,702, Cl. 350-96.230.
Rosin, Michael L.; O'Connor, James M.; Schnabel, Wilhelm J.; and Early, Robert M., 4,480,081, Cl. 528-49.000.
Rothgery, Eugene F.; and Manke, Steven A., 4,479,917, Cl. 422-16.000.
Olivier, Jean-Marie R., to Societe Nationale Detude et de Construction de Moteurs D'Aviation. Roller bearing comprising a lubricating device for an inner raceway. 4,479,682, Cl. 384-475.000.
Olszewski, Anthony R.: *See*—
Hoda, Syed N.; and Olszewski, Anthony R., 4,480,060, Cl. 523-466.000.
Olympus Optical Company Limited: *See*—
Shirako, Hideo, 4,479,580, Cl. 206-387.000.
O'Neill, George J., to Eastman Kodak Company. Radiation-resistant copolyesters. 4,480,086, Cl. 528-295.300.
Onishi, Yasunobu: *See*—
Hayase, Shuzi; and Onishi, Yasunobu, 4,479,860, Cl. 204-159.110.
Ono Pharmaceutical Co., Ltd.: *See*—
Hayashi, Masaki; Shuto, Katsuhiko; and Iijima, Yoshitsugu, 4,479,944, Cl. 424-180.000.
Hayashi, Masaki; Konishi, Yoshitaka; and Arai, Yoshinobu, 4,479,966, Cl. 424-305.000.
Onouchi, Takashi: *See*—
Ichishima, Fiji; and Onouchi, Takashi, 4,480,037, Cl. 435-221.000.
Ooi, Kazushige: *See*—
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, 4,480,269, Cl. 358-209.000.
Opsahl, Allan W.: *See*—
Maraghe, Alex; and Opsahl, Allan W., 4,479,623, Cl. 244-129.500.
Opsal, Roy T., to Canadian Mountaineering Equipment Ltd. Back pack. 4,479,595, Cl. 224-211.000.
Orieux, Francois; and Bertheas, Jean, to Thomson CSF. Passive underwater range measurement acoustic system. 4,480,322, Cl. 367-123.000.
Orlowski, Eugene J., Jr.: *See*—
Baker, Lewin T.; and Orlowski, Eugene J., Jr., 4,480,232, Cl. 331-1.00A.
Orlowski, Jan A.; and Butler, David V., to Scientific Pharmaceuticals, Inc. Visible light-cured orthodontic adhesive. 4,479,782, Cl. 433-220.000.
Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,479,964, Cl. 424-278.000.
Orton, Michael L.; and Spurr, William I., to Imperial Chemical Industries PLC. Copolymerization of unsaturated urethane monomers. 4,480,079, Cl. 526-301.000.
Osaki, Tatsuo, to Yoshida Kogyo K. K. Space forming and stop fixing apparatus for fastener chains. 4,479,290, Cl. 29-33.200.
Osawa, Michitaka; and Maekawa, Hitoshi, to Hitachi, Ltd. Gamma correction circuit. 4,480,268, Cl. 358-164.000.
Osher, John E., to United States of America, Energy. Gas pump with movable gas pumping panels. 4,479,361, Cl. 62-55.500.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, to Exxon Research & Engineering Company. Trihydrocarbyl silyl substituted alkyl diaryl phosphine transition metal complexes and their use as homogeneous carbonylation catalysts. 4,480,137, Cl. 568-454.000.
Otis Engineering Corporation: *See*—
Tamplen, Jack W.; and Young, Carter R., 4,479,539, Cl. 166-212.000.
Otsubo, Toru; Aiuchi, Susumu; and Kamimura, Takashi, to Hitachi, Ltd. Etching method and apparatus. 4,479,848, Cl. 156-626.000.
Oude Alink, Bernardus A., to Petrolite Corporation. Hexahydropyrimidines and corresponding linear polyamines. 4,480,095, Cl. 544-242.000.
Outboard Marine Corporation: *See*—
Burrows, Thomas W.; and Cavil, David T., 4,479,467, Cl. 123-606.000.
Owen, Hartley: *See*—
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,479,812, Cl. 55-48.000.
Owens, Robert A.; and Diener, Theodor O., to United States of America, Agriculture. Sensitive and rapid diagnosis of viroid diseases and viruses. 4,480,040, Cl. 436-504.000.
Oya, Masayuki: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,479,949, Cl. 424-248.400.
Ozawa, Tetsuo: *See*—
Mukoh, Akio; Kitamura, Teruo; Kaneko, Masaharu; and Ozawa, Tetsuo, 4,479,885, Cl. 252-299.620.
Pace, Marshall O.: *See*—
Adcock, James L.; Pace, Marshall O.; and Christophorou, Loucas G., 4,480,147, Cl. 174-14.00R.
Packer, Samuel: *See*—
Lambrecht, Richard M.; and Packer, Samuel, 4,479,931, Cl. 424-1.100.
Paeglis, Arnis U., to Uniroyal, Inc. Elastomeric composition. 4,480,062, Cl. 524-394.000.
Page, Robert E., to United States of America, Navy. Remote self-contained undersea monitor. 4,480,323, Cl. 367-131.000.
Pagel, Paul V., to Microdot Inc. Preloaded locknut. 4,479,747, Cl. 411-8.000.

Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., to Union Carbide Corporation. Process to separate natural gas liquids from nitrogen-containing natural gas. 4,479,871, Cl. 208-340.000.

Pailhes, Alain: *See*—
Mastain, Pierre; and Pailhes, Alain, 4,480,311, Cl. 364-527.000.

Palazzolo, Faro D.; Magnuson, Roland A.; and Aoki, Earl S., to United States of America, Army. Transmission disconnect utilizing an axially shiftable drive collar. 4,479,568, Cl. 192-67.00R.

Pall Corporation: *See*—
Rosenberg, David J.; and Matkovich, Vlado I., 4,479,874, Cl. 210-445.000.
Tinker, Craig S.; and Haberer, Thomas G., 4,479,815, Cl. 55-163.000.

Palmer, Michael: *See*—
Clonce, Ambrose J.; Palmer, Michael; and Gott, Samuel L., 4,480,116, Cl. 560-4.000.

Pan Electric Corporation: *See*—
Cornell, Paul V.; and Cornell, Paul A., 4,479,694, Cl. 339-266.00R.

Pandrol Limited: *See*—
Burr, Martin A.; Conroy, Brian G.; and Spencer, Maurice, 4,479,440, Cl. 104-17.00A.

Papalos, John G.; and Savoly, Arpad, to Diamond Shamrock Chemicals Company. Condensation products of substituted phenol sulfonic acid and formaldehyde. 4,479,826, Cl. 106-90.000.

Parikh, Kamal I.: *See*—
Magnusson, Stig E.; Puccini, Sergio E.; and Parikh, Kamal I., 4,480,330, Cl. 370-110.200.

Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Co. Method and apparatus for reducing field filter cake on sponge cores. 4,479,557, Cl. 175-59.000.

Parks, Albert R., to United States of America, Navy. Organotin antifouling coatings with novolac and Bisphenol-A epoxy resins. 4,480,056, Cl. 523-122.000.

Parks, Leon C., to Research Against Cancer, Inc. Subcutaneous implant useful in effecting hyperthermic treatment. 4,479,798, Cl. 604-175.000.

Parliment, Thomas H.: *See*—
Soukup, Robert J.; and Parliment, Thomas H., 4,479,972, Cl. 426-536.000.

Paros, Jerome: *See*—
Banik, Gary J.; EerNisse, Errol; Kistler, Walter P.; and Paros, Jerome, 4,479,391, Cl. 73-862.590.

Passafiume, Anthony: *See*—
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,479,836, Cl. 156-164.000.

Patel, Parbhubhai D.: *See*—
Levy, Nicha; and Patel, Parbhubhai D., 4,479,984, Cl. 427-54.100.

Pattison, Daniel J. Two wheel synchronously driven bicycle. 4,479,660, Cl. 280-261.000.

Paul, Jurgen: *See*—
Burckhardt, Manfred; Paul, Jurgen; and Brugger, Franz, 4,480,309, Cl. 364-426.000.

Pauze, Denis R., to General Electric Company. Enamel having improved coatability and insulated electrical articles produced therefrom. 4,480,007, Cl. 428-379.000.

Peaden, Paul A.: *See*—
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., 4,479,380, Cl. 73-61.10C.

Pearson, Arthur C., to ACF Industries, Incorporated. Vertical railway car air brake system. 4,479,567, Cl. 188-47.000.

Peck, Alan M.: *See*—
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,479,446, Cl. 112-121.120.

Peddinghaus, Rolf: *See*—
Klaus, Siegfried; and Einhaus, Albert, 4,479,375, Cl. 72-387.000.

Pedersen, Poul K.: *See*—
Larsen, Borge; Pedersen, Poul K.; and Lauritzen, Georg, 4,479,347, Cl. 56-344.000.

Peiffer, Dennis G.: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; and Phillips, Robert R., 4,480,063, Cl. 524-399.000.

Pelloux-Gervais, Pierre, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Atmospheric heaters. 4,479,359, Cl. 62-52.000.

Penfold, John: *See*—
Bosscher, Filippus; Penfold, John; Reich, Klaus W.; and Zandvoort, Albertus, 4,480,070, Cl. 524-591.000.

Penninger, Stefan: *See*—
Heitkamper, Peter; Fauss, Rudolf; Findeisen, Kurt; Penninger, Stefan; and Scholl, Hans-Joachim, 4,480,110, Cl. 549-467.000.

Pennzoil Company: *See*—
Sardisco, John B.; Holcomb, Dysart E.; and Drechsel, Erhart K., deceased, 4,479,923, Cl. 423-320.000.

Pentapharm A.G.: *See*—
Svendsen, Lars G., 4,480,030, Cl. 435-13.000.

Penterson, Craig A.: *See*—
Itse, Daniel C.; and Penterson, Craig A., 4,479,442, Cl. 110-261.000.

Perkin-Elmer Corporation, The: *See*—
Gelernt, Barry, 4,479,927, Cl. 423-481.000.

Perkins Engine Group Limited: *See*—
Curley, Laurence D.; Whitehead, David A.; and Bedborough, Rodney A., 4,479,463, Cl. 123-195.00C.

Permutit-Boby Limited: *See*—
Treanor, Anthony I. J., 4,479,880, Cl. 210-795.000.

Persson, Ingemar; and Eklind, Olov. Tertiary heat exchanger. 4,479,533, Cl. 165-140.000.

Pervaiz, Khalid: *See*—
Haushalter, Frederick W.; Coughlin, Stanley J.; and Pervaiz, Khalid, 4,480,165, Cl. 219-85.00R.

Peters, David L.: *See*—
Mallinson, Richard B.; Mecklenborg, Richard A.; Peters, David L.; and Lakshminarayanasetty, Kadam S., 4,479,784, Cl. 434-43.000.

Peterson, Dale; and Martin, Dean. Mortise and tenon jig. 4,479,523, Cl. 144-144.50R.

Petrolite Corporation: *See*—
Oude Alink, Bernardus A., 4,480,095, Cl. 544-242.000.

Petterson, William C.; and Hackemesser, Larry G., to M. W. Kellogg Company, The. Flexible feed pyrolysis process. 4,479,869, Cl. 208-130.000.

Pfaff, Gerhard; and Wick, Albert, to Siemens Aktiengesellschaft. Method and apparatus for controlling a pulsed frequency converter. 4,480,301, Cl. 363-137.000.

Pfuhl, Berthold: *See*—
Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, 4,480,202, Cl. 310-12.000.

Phillips Petroleum Company: *See*—
Barton, Hugh M., Jr., 4,479,857, Cl. 204-130.000.
Cobb, Raymond L., 4,480,142, Cl. 385-465.000.
Drake, Charles A., 4,480,141, Cl. 568-798.000.
Senatore, Guy, 4,479,837, Cl. 156-169.000.

Phillips, Robert R.: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; and Phillips, Robert R., 4,480,063, Cl. 524-399.000.

Phillips, Ronald: *See*—
Logie, Frank M.; and Phillips, Ronald, 4,480,208, Cl. 310-194.000.

Pike, Roscoe A., to United Technologies Corporation. Water soluble polyimide resin system. 4,480,088, Cl. 528-353.000.

Pilat, John F.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.

Piper, Jack R., to International Telephone and Telegraph Corporation. Sequencing blow down valve mechanism. 4,479,459, Cl. 122-379.000.

Pirich, Peter J., Jr.: *See*—
McKelley, Charles R., Jr.; Minshall, Leslie A.; and Pirich, Peter J., Jr., 4,480,314, Cl. 364-900.000.

Pitney Bowes Inc.: *See*—
Feinland, Seymour; Freeman, Gerald C.; Viera, Vincent F.; and Sette, Paul R., 4,479,561, Cl. 177-154.000.

Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, to Chemiefaser Lenzing Aktiengesellschaft. Low profile circular loom. 4,479,517, Cl. 139-13.00R.

Planeta, Mirek, to Macro Engineering Company. Apparatus for the production of plastic film. 4,479,766, Cl. 425-72.00R.

Plastipak Packaging, Inc.: *See*—
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,770, Cl. 425-503.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,479,771, Cl. 425-503.000.

Plessey Overseas Limited: *See*—
Archer, Steven K., 4,480,148, Cl. 174-51.000.

Pletsch, Hubert: *See*—
Wolf, Franz J.; and Pletsch, Hubert, 4,479,638, Cl. 267-64.170.

Polaroid Corporation: *See*—
Haas, Howard C.; Jasne, Stanley J.; and Moreau, Robert D., 4,480,125, Cl. 564-144.000.

Pollich, Gerhard, to Heidelberger Druckmaschinen AG. Sheet deliverer for rotary printing machines. 4,479,645, Cl. 271-183.000.

Polytronic AG: *See*—
Benoit, Eric, 4,480,313, Cl. 364-565.000.

Pomeranz, Robert B. Gun sight for hand and shoulder guns. 4,479,307, Cl. 33-233.000.

Popp, Gerhard: *See*—
Chang, Hao J.; Popp, Gerhard; and Saturno, Patrick H., 4,480,025, Cl. 430-206.000.

Porter, Allen C.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.

Portmann, Plato: *See*—
Bachmann, Heinrich; and Portmann, Plato, 4,479,803, Cl. 8-406.000.

Portwood, Joseph N.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.

Pospisil, Robert S.: *See*—
Shackle, Peter W.; and Pospisil, Robert S., 4,480,219, Cl. 318-729.000.

Postle, Stephen R.; and Thomas, Patrick D. P., to Ciba-Geigy AG. Hydroquinone derivatives and their use in photographic materials. 4,480,104, Cl. 549-71.000.

Pouchain, Maurizio; and Medolago Albani, Ludovico. Restoration of stone objects. 4,479,503, Cl. 134-2.000.

Pozniak, Donald J.: *See*—
Robertson, Gerald F.; Pozniak, Donald J.; and McClain, Michael J., 4,479,765, Cl. 417-380.000.

Prabhu, Ashok N.; and Boardman, Simon M., to RCA Corporation. Thick film resistor inks. 4,479,890, Cl. 252-508.000.

Preist, Donald H.; and Shrader, Merrald B., to Varian Associates, Inc. Gridded electron power tube. 4,480,210, Cl. 315-4.000.
Preston, Burton L.: *See*—
Nestich, R. Frank; and Preston, Burton L., 4,479,631, Cl. 251-24.000.
Preti, Roberto: *See*—
Alaria, Gian B.; and Preti, Roberto, 4,480,328, Cl. 370-63.000.
Priegnitz, James W.; and Zinsen, Hermann A., to UOP Inc. Process for separating isomers of toluidine. 4,480,129, Cl. 564-424.000.
Prober, James M., to Du Pont de Nemours, E. I., and Company. Method for indicating an insufficient level of yarn finish. 4,479,979, Cl. 427-9.000.
Procter & Gamble Company, The: *See*—
Mustacich, Robert V.; Lucas, Donald S.; and Stone, Roger L., 4,479,795, Cl. 604-53.000.
Prof. Bloodgood's Photographic Emporium, Inc.: *See*—
Pursell, Kenneth D., 4,479,712, Cl. 355-55.000.
Prokopp, Raymond: *See*—
de Bellis, Laurent; and Prokopp, Raymond, 4,480,018, Cl. 429-160.000.
Prosise, William E.: *See*—
Dashiell, Gregory L.; and Prosise, William E., 4,479,977, Cl. 426-609.000.
Proud, Joseph M.: *See*—
Lapatovich, Walter P.; Gibbs, George R.; and Proud, Joseph M., 4,480,213, Cl. 315-248.000.
Prusak, John J., to RCA Corporation. Method for the manufacture of record stampers. 4,479,853, Cl. 204-5.000.
Pryor, Michael J.; and Winter, Joseph, to Olin Corporation. Method and apparatus for assembling a compact multi-conductor optical fiber communication cable. 4,479,702, Cl. 350-96.230.
PSW, Inc.: *See*—
Wells, Peggy S., 4,480,293, Cl. 362-108.000.
Puccini, Sergio E.: *See*—
Magnusson, Stig E.; Puccini, Sergio E.; and Parikh, Kamal I., 4,480,330, Cl. 370-110.200.
Purdue Research Foundation: *See*—
Chen, Li F.; and Seethanathan, Parakkat, 4,480,089, Cl. 536-56.000.
Pursell, Kenneth D., to Prof. Bloodgood's Photographic Emporium, Inc. Apparatus and method for producing a selected enlargement of a graphic image. 4,479,712, Cl. 355-55.000.
Puttner, Reinhold: *See*—
Arndt, Friedrich; Franke, Heinrich; Schmidt, Erich; and Puttner, Reinhold, 4,479,822, Cl. 71-111.000.
QO Chemicals, Inc.: *See*—
Akerberg, Denis W.; and Rude, Carl A., 4,479,913, Cl. 264-29.500.
Quartex, Inc.: *See*—
Banik, Gary J.; EerNisse, Errol; Kistler, Walter P.; and Paros, Jerome, 4,479,391, Cl. 73-862.590.
Quick, Nathaniel R.: *See*—
Milligan, Edward J.; Nauman, Delbert A.; and Quick, Nathaniel R., 4,480,014, Cl. 428-672.000.
R. W. Hartnett Company: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,479,573, Cl. 198-399.000.
Raden, David T.; and Hopkins, Jack E., to Raden, David T.; and Raden, Gayle Kim. Toilet seat cover locking device. 4,479,273, Cl. 4-253.000.
Raden, Gayle Kim: *See*—
Raden, David T.; and Hopkins, Jack E., 4,479,273, Cl. 4-253.000.
Radowsky, Peter, Jr. Safety harness. 4,479,267, Cl. 2-2.000.
Ragan, Eddie D., to Continental Conveyor & Equipment Co., Inc. Cotton module dispersing and feeding system with improved electrical controls. 4,479,285, Cl. 19-64.500.
Raiche, Rejean. Differential feed type sewing machine. 4,479,449, Cl. 112-312.000.
Raihala, Kenneth H. Safety stovepipe damper assembly. 4,479,483, Cl. 126-292.000.
Rain Bird Consumer Products Mfg. Corp.: *See*—
Galvis, Oscar, 4,479,611, Cl. 239-205.000.
Rakoczi, Istva n: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Rampf, Rudolf; and Sollner, Erich, to Ciba-Geigy GmbH. Distance sheeting for the construction of molds and models. 4,480,006, Cl. 428-343.000.
Ramsdale, Douglas S.: *See*—
Eichner, Falk J.; Ramsdale, Douglas S.; and Bourbon, Jean, 4,479,577, Cl. 206-45.180.
Ranco Incorporated: *See*—
Gabler, Dieter, 4,479,670, Cl. 251-328.000.
Rapp, Peter; and Ritterhoff, Heinrich, to Maschinenfabrik J. Dieffenbacher GmbH & Co. Insertion and removal apparatus for press cauls. 4,479,841, Cl. 156-379.800.
Raskin, Donald: *See*—
Anderson, Philip M., III; Reich, Ronald K.; and Raskin, Donald, 4,479,389, Cl. 73-651.000.
Raskov, Herman E. Insulated electric heating element. 4,480,176, Cl. 219-461.000.
Raytheon Company: *See*—
Jensen, Kai, 4,480,287, Cl. 361-388.000.
Raz, Zeev, to Shilemay Plastics Products Ltd. Storage and dispensing means for sanitary commodities. 4,479,584, Cl. 211-89.000.
RCA Corporation: *See*—
Duschl, Robert A., 4,480,264, Cl. 358-10.000.
Landia, William C.; and Nyul, Paul, 4,479,698, Cl. 350-96.200.
Prabhu, Ashok N.; and Boardman, Simon M., 4,479,890, Cl. 252-508.000.
Prusak, John J., 4,479,853, Cl. 204-5.000.
Smith, Thomas E.; and Wang, Chih C., 4,479,851, Cl. 203-80.000.
Realex Corporation: *See*—
Ford, John M. B., 4,479,589, Cl. 222-153.000.
Rebandt, Ralph A. Gasoline-substitute fuel. 4,479,807, Cl. 44-56.000.
Recasens, Joseph: *See*—
Blanchet, Pierre; and Recasens, Joseph, 4,479,778, Cl. 432-180.000.
Redder, Manfred: *See*—
Grundken, Dieter; Bruggemann, Reinhold; Linke, Horst; and Redder, Manfred, 4,479,575, Cl. 198-735.000.
Reddiplex Limited: *See*—
Dawson, Charles D., 4,479,988, Cl. 428-34.000.
Redmon, John W.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.
Redwine, Ras, V: *See*—
Lanier, Ted B.; and Redwine, Ras, V, 4,479,366, Cl. 62-304.000.
Reed, Lehman T., to Midway Fishing Tool Co. Power tubing hanger and tubing string lifting assembly. 4,479,537, Cl. 166-77.000.
Reese, Morris T.: *See*—
Whitman, Boyce D.; Beltz, Donald G.; and Reese, Morris T., 4,480,286, Cl. 361-314.000.
Reeves, George H.: *See*—
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., 4,479,854, Cl. 204-12.000.
Regel, Erik, to Bayer Aktiengesellschaft. 2-(4-Biphenylyl)-2-(halophenyl)-oxirane compounds. 4,480,114, Cl. 549-563.000.
Regie Nationale des Usines Renault: *See*—
Arnaud, Henri, 4,479,478, Cl. 123-571.000.
Regnier, Gilbert; and Bure, Jacques, to Science Union Et Cie. Monosubstituted piperazines. 4,479,952, Cl. 424-250.000.
Reich, Klaus W.: *See*—
Boscher, Filippus; Penfold, John; Reich, Klaus W.; and Zandvoort, Albertus, 4,480,070, Cl. 524-591.000.
Reich, Ronald K.: *See*—
Anderson, Philip M., III; Reich, Ronald K.; and Raskin, Donald, 4,479,389, Cl. 73-651.000.
Reichel, Artur; and Richter, Kurt, to Ernst Leitz Wetzlar GmbH. Microtome drive. 4,479,402, Cl. 74-625.000.
Relf, David J.: *See*—
Ciciliot, Henry; and Relf, David J., 4,480,172, Cl. 219-305.000.
Remlinger Manufacturing Co., Inc.: *See*—
Fegley, Richard L., 4,479,549, Cl. 172-142.000.
Resch, Alois R., to Allied Corporation. Cable terminating tool. 4,479,301, Cl. 29-721.000.
Research Against Cancer, Inc.: *See*—
Parks, Leon C., 4,479,798, Cl. 604-175.000.
Rexroat, Elwood D.: *See*—
Walker, William H., 4,479,445, Cl. 112-80.000.
Rexroat, Shirley J.: *See*—
Walker, William H., 4,479,445, Cl. 112-80.000.
Reynolds, Blake: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,479,810, Cl. 48-86.00R.
Reynolds, Florence U. Stroller skis. 4,479,657, Cl. 280-8.000.
Reynolds, Robert W.: *See*—
Jelinek, Ross R.; and Reynolds, Robert W., 4,479,397, Cl. 74-89.150.
Rhodes, Robin B., to Air Preheater Company, Inc., The. Transparent radiation recuperator. 4,479,534, Cl. 165-142.000.
Rich, Donald G.: *See*—
Domingorena, Albert A.; Rich, Donald G.; and Manning, John D., 4,479,727, Cl. 374-45.000.
Richard, Laurey J.: *See*—
Brown, Roger S.; Shepard, Charles L.; and Richard, Laurey J., 4,479,286, Cl. 19-200.000.
Richter, George N.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,479,810, Cl. 48-86.00R.
Richter, Kurt: *See*—
Reichel, Artur; and Richter, Kurt, 4,479,402, Cl. 74-625.000.
Richter, Werner H. Trimmer for lawn sprinklers. 4,479,302, Cl. 30-122.000.
Ricoh Company, Ltd.: *See*—
Takahashi, Akira, 4,479,706, Cl. 354-403.000.
Yoshioka, Satoru; Namekawa, Takumi; and Mitsuki, Iwao, 4,479,730, Cl. 400-208.000.
Rieger, Herbert. Agitator for grape mash fermentation tanks. 4,479,721, Cl. 366-327.000.
Rieger, Wolfgang, to Zahnradfabrik Friedrichshafen, AG. Rack and pinion steering gear, especially for motor vehicles. 4,479,400, Cl. 74-422.000.
Riekels, Lynda M., to Inland Steel Company. Brazing method and alloy for bismuth steel. 4,480,015, Cl. 428-677.000.
Riker Laboratories, Inc.: *See*—
Thiel, Charles G., 4,479,799, Cl. 604-187.000.

Riley, Dale. Differential gear housing mounted power take-off unit. 4,479,395, Cl. 74-15.840.

Riley Stoker Corporation: *See*—
Itse, Daniel C.; and Penterson, Craig A., 4,479,442, Cl. 110-261.000.

Rinaldi, Rinaldo; Ghermignari, Alberto; and Marcori, Claudio, to Riri Italia S.p.A. Structure with adjustably-tiltable articulated arms for wind up sunshade tents. 4,479,526, Cl. 160-22.000.

Rink, Karl-Heinz: *See*—
Merk, Wolfgang; and Rink, Karl-Heinz, 4,479,820, Cl. 71-67.000.

Riri Italia S.p.A.: *See*—
Rinaldi, Rinaldo; Ghermignari, Alberto; and Marcori, Claudio, 4,479,526, Cl. 160-22.000.

Ritter, Ernst: *See*—
Djordjevic, Ilija; Bruhmann, Werner; Ritter, Ernst; and Frey, Hansjorg, 4,479,474, Cl. 123-373.000.

Ritterhoff, Heinrich: *See*—
Rapp, Peter; and Ritterhoff, Heinrich, 4,479,841, Cl. 156-379.800.

RLI, Inc.: *See*—
Lanier, Ted B.; and Redwine, Ras, V, 4,479,366, Cl. 62-304.000.

Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, to Storage Technology Corporation. Automatic velocity calibrator for a velocity servo loop in a magnetic disk drive. 4,480,217, Cl. 318-618.000.

Robbins, Robert E.: *See*—
Holland, Marion D., 4,479,511, Cl. 137-614.200.

Robert Bosch GmbH: *See*—
Babitzka, Rudolf, 4,479,475, Cl. 123-446.000.
Djordjevic, Ilija; Bruhmann, Werner; Ritter, Ernst; and Frey, Hansjorg, 4,479,474, Cl. 123-373.000.
Horstmann, Winfried, 4,480,272, Cl. 360-8.000.
Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, 4,480,202, Cl. 310-12.000.

Robertiello, Andrea; Angelini, Leonello; and Degen, Ludwig, to E.N.I. Ente Nazionale Idrocarburi. Balanced feedingstuffs for ruminants, and the method for their production. 4,479,978, Cl. 426-636.000.

Roberts, Clark S.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,479,335, Cl. 52-205.000.

Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., to Western Sun, Inc. Interior wall system. 4,479,335, Cl. 52-205.000.

Roberts, Glenn H.: *See*—
Lubold, Harvey C., Jr.; and Roberts, Glenn H., 4,479,521, Cl. 141-12.000.

Roberts, Richard A.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,479,335, Cl. 52-205.000.

Roberts, W. Calvin: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,479,335, Cl. 52-205.000.

Robertson, Archibald: *See*—
Goidich, Stephen J.; Robertson, Archibald; and Wolowodiuk, Walter, 4,479,458, Cl. 122-4.00D.

Robertson, Gerald F.; Pozniak, Donald J.; and McClain, Michael J., to General Motors Corporation. Exhaust gas operated vacuum pump assembly. 4,479,765, Cl. 417-380.000.

Robertson, Gordon M. Building elements and method of constructing a building. 4,479,338, Cl. 52-426.000.

Roe, Thorndyke, Jr.: *See*—
Inouye, Alan T.; Wilson, Jeffrey V.; Tausig, Wayne R.; and Roe, Thorndyke, Jr., 4,479,690, Cl. 339-94.00C.

Roesch, Egon: *See*—
Wiedemann, Fritz; Michel, Helmut; Weckerle, Wolfgang; Roesch, Egon; and Strein, Klaus, 4,479,962, Cl. 424-273.00N.

Rogers, Alfred N.: *See*—
Awerbuch, Leon; and Rogers, Alfred N., 4,479,351, Cl. 60-641.500.

Rogers, John T.; and Manning, Kenneth J. R., to Boeing Company, The. Wing load alleviation system using tabbed allerons. 4,479,620, Cl. 244-75.00R.

Rohr, Gunter H., to Union Special GmbH. Method and apparatus for sewing on a tubular workpiece edge. 4,479,447, Cl. 112-141.000.

Rolfe, John A.: *See*—
Humphreys, Michael; and Rolfe, John A., 4,479,687, Cl. 339-22.00B.

RoMark Technology, Inc.: *See*—
Schroeder, Robert W., 4,479,279, Cl. 15-159.00R.

Roper, Jerry M., to Ethyl Corporation. Chemical process. 4,480,133, Cl. 568-362.000.

Rosen, Bruce I., to UOP Inc. Selective reduction of edible fats and oils; platinum and palladium on titania. 4,479,902, Cl. 260-409.000.

Rosenberg, David J.; and Matkovich, Vlado I., to Pall Corporation. Convoluted plural layer filter assembly. 4,479,874, Cl. 210-445.000.

Rosin, Michael L.; O'Connor, James M.; Schnabel, Wilhelm J.; and Early, Robert M., to Olin Corporation. Isocyanate-reactive compounds from modified TDI distillation residue intermediates and polyurethanes prepared therefrom. 4,480,081, Cl. 528-49.000.

Ross, Colin F., to National Research Development Corporation. Method and apparatus for active sound control. 4,480,333, Cl. 381-71.000.

Rother, Hubert, to Bayerische Motoren Werke AG. Adjusting mechanism for position-adjustable connected structural parts, especially a driving-belt tension mechanism with a clamping coverplate. 4,479,734, Cl. 403-4.000.

Rothgery, Eugene F.; and Manke, Steven A., to Olin Corporation. Use of aminoguanidine compounds as oxygen-scavenging and corrosion-inhibiting agents. 4,479,917, Cl. 422-16.000.

Rotolo, Frank J. Protective elbow pad for dogs and method. 4,479,457, Cl. 119-143.000.

Roussel, Francois: *See*—
Barthelemy, Philippe; Baurand, Gilles; and Roussel, Francois, 4,480,194, Cl. 307-132.00E.

Rowledge, Bernard J., to Sardon International Limited. Pulverizing machines. 4,479,613, Cl. 241-48.000.

Roy E. Roth Company: *See*—
Sieghartner, Leonard J., 4,479,756, Cl. 415-53.00T.

Roychowdhury, Sukomal. Production of hydrogen. 4,480,035, Cl. 435-168.000.

Rubatex Corporation: *See*—
Balliet, Karl E., 4,479,269, Cl. 2-23.000.

Rude, Carl A.: *See*—
Akerberg, Denis W.; and Rude, Carl A., 4,479,913, Cl. 264-29.500.

Rudenauer, Kenneth A.: *See*—
Wong, Joseph S.; Chung, Kuo-Ing; and Rudenauer, Kenneth A., 4,480,336, Cl. 455-328.000.

Rusakov, Igor G.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.

Rusen, Jochen: *See*—
Kuhn, Hans; and Rusen, Jochen, 4,479,550, Cl. 173-112.000.

Rusing, Arnold E.; and von Schuckmann, Alfred, to Blendax-Werke R. Schneider GmbH & Co.; and Mega Products-und Verpackungsentwicklung Marketing GmbH & Co., KG. Dispenser. 4,479,592, Cl. 222-319.000.

Russell, Dennis E., to Alton Packaging Corporation. Paperboard picture frame or the like support and display. 4,479,318, Cl. 40-154.000.

Russell, Terrance J.: *See*—
Edwards, Donald W.; Russell, Terrance J.; and Williams, Donald J., 4,480,003, Cl. 428-329.000.

Russo, Robert V., to Mobil Oil Corporation. Thermoplastic composition containing a poly(methyl ethenyl benzene) resin and a poly(phenylene oxide) resin. 4,480,073, Cl. 525-68.000.

Rutgersson, Goran. Fastener intended especially for canvas. 4,479,289, Cl. 24-687.000.

Rutzen, Horst, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of quaternary ammonium compounds. 4,480,126, Cl. 564-292.000.

S. J. Industries, Inc.: *See*—
Julius, Richard F.; and Lund, John C., 4,479,574, Cl. 198-626.000.

Sabins, Kenneth C., to Goodyear Tire & Rubber Company, The. Method of manufacturing a rubber shoe sole. 4,479,296, Cl. 29-527.100.

Sachs, Howard M.: *See*—
Becker, Mitchell; and Sachs, Howard M., 4,480,127, Cl. 564-402.000.

Safilo S.p.A.: *See*—
Simioni, Francesco, 4,479,769, Cl. 425-434.000.

Saint-Gobain Emballage: *See*—
Ducloux, Marcel, 4,479,582, Cl. 209-552.000.

Saitoh, Koichi: *See*—
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,480,258, Cl. 346-135.100.

Sakabe, Naoko: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.

Sakai, Keijiro: *See*—
Muto, Nobuyoshi; Sakai, Keijiro; Matsuda, Yasuo; and Nandoh, Kenji, 4,480,299, Cl. 363-41.000.

Sakai, Sumio: *See*—
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, 4,480,269, Cl. 358-209.000.

Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Nakajima, Seiichiro; Sakakibara, Shinsuke; and Nihei, Ryo, 4,479,673, Cl. 294-88.000.

Sakakibara, Susumu: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Sakakibara, Susumu, 4,480,280, Cl. 360-78.000.

Sakamaki, Hiroshi; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Rotary compressor. 4,479,763, Cl. 418-144.000.

Sakamoto, Takashi: *See*—
Takahashi, Kenzo; and Sakamoto, Takashi, 4,480,156, Cl. 179-170.200.

Sakane, Kazuo: *See*—
Yamashita, Michio; Komori, Tadzaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.

Sakurada, Nobuaki: *See*—
Kiuchi, Masayoshi; and Sakurada, Nobuaki, 4,479,707, Cl. 354-426.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Sakakibara, Susumu, 4,480,280, Cl. 360-78.000.

Salah, Ibrahim M. Electronic digital display watch having solar and geographical functions. 4,479,722, Cl. 368-17.000.

Salensky, George A.: *See*—
Chopra, Kuldip S.; Ealer, George E.; and Salensky, George A., 4,480,064, Cl. 524-413.000.
Sander, Charles: *See*—
Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, 4,480,217, Cl. 318-618.000.
Sandhaus, Jeffrey. Tamper resistant safety closure and closure-container combination. 4,479,585, Cl. 215-218.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,479,369, Cl. 68-5.00C.
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, to Sando Iron Works Co., Ltd. Apparatus for treating a textile product with the use of low-temperature plasma. 4,479,369, Cl. 68-5.00C.
Sandow, Peter M.; and Chin, Barry L., to Burroughs Corporation. Method of making low resistance polysilicon gate transistors and low resistance interconnections therefor via gas deposited in-situ doped amorphous layer and heat-treatment. 4,479,831, Cl. 148-1.500.
Sandoz, Inc.: *See*—
Fong, Jones W., 4,479,911, Cl. 264-4.600.
Sangamo Weston, Inc.: *See*—
Whitman, Boyce D.; Beltz, Donald G.; and Reese, Morris T., 4,480,286, Cl. 361-314.000.
Sangster, William H.; and Moss, Gilbert G., to National Steel Corporation. Apparatus for and method of repairing bottom lining of a converter. 4,479,637, Cl. 266-281.000.
Sankyo Company, Limited: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,479,965, Cl. 424-279.000.
Sano, Hironari, to Mitsubishi Petrochemical Co., Ltd. Impact-resistant poly(phenylene oxide) compositions comprising encapsulated filler material. 4,480,057, Cl. 523-206.000.
Sano, Shunichi: *See*—
Tojo, Toru; Mori, Ichiro; and Sano, Shunichi, 4,480,284, Cl. 361-234.000.
Santa Barbara Research Center: *See*—
Buller, J. Stanley, 4,479,367, Cl. 62-514.00R.
Santalucia, Andre R.: *See*—
Billard, Alain A.; Santalucia, Andre R.; and Encoyand, Roland C., 4,479,417, Cl. 89-1.50D.
Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,479,949, Cl. 424-248.400.
Santos, Ruben A.; Kipp, William G.; and MacPherson, Edwin J., to Fiberglas Canada Inc. High temperature resistant binders. 4,480,068, Cl. 524-456.000.
Sanvitale, Salvatore. Coffee-brew percolator. 4,479,421, Cl. 99-303.000.
Sanyo Electric Company Ltd.: *See*—
Kishi, Hiroyasu, 4,480,335, Cl. 455-212.000.
Sardisco, John B.; Holcomb, Dysart E.; and Drechsel, Erhart K., deceased (by Drechsel, Harriet K., executrix), to Pennzoil Company. Production of phosphoric acid and additional products from phosphate ore. 4,479,923, Cl. 423-320.000.
Sardon International Limited: *See*—
Rowledge, Bernard J., 4,479,613, Cl. 241-48.000.
Sasagawa, Kinichi: *See*—
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,479,280, Cl. 15-217.000.
Sasaki, Koji: *See*—
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, 4,479,937, Cl. 424-99.000.
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, to Citizen Watch Co., Ltd. Method and coating materials by ion plating. 4,480,010, Cl. 428-457.000.
Sato, Hideo: *See*—
Kondo, Syunichi; Sato, Hideo; Honjo, Satoru; and Umehara, Akira, 4,480,020, Cl. 430-81.000.
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, to Zeria Shinyaku Kogyo Kabushiki Kaisha. Process of treating inflammation with human urinary thiol protease inhibitor. 4,479,937, Cl. 424-99.000.
Sato, Hiroshi: *See*—
Kosugi, Masao; Sato, Hiroshi; Takahashi, Kazuo; Ishiyama, Ichiro; and Yabu, Shuichi, 4,479,711, Cl. 355-43.000.
Sato, Hisato: *See*—
Takatsu, Haruyoshi; and Sato, Hisato, 4,480,117, Cl. 560-1.000.
Sato, Kenjiro: *See*—
Echigo, Ryozo; Noda, Takaaki; Kinto, Koichiro; and Sato, Kenjiro, 4,479,535, Cl. 165-142.000.
Sato, Kiyomi: *See*—
Ishikura, Takashi; Mino, Joji; Sato, Kiyomi; and Nagato, Takaaki, 4,480,157, Cl. 191-34.000.
Sato, Norio: *See*—
Sekimoto, Hironobu; and Sato, Norio, 4,479,294, Cl. 29-159.200.
Satoh, Yutaka: *See*—
Okumura, Shuichi; and Satoh, Yutaka, 4,479,607, Cl. 238-349.000.
Satomura, Masato: *See*—
Ichijima, Seiji; Ohki, Nobutaka; Satomura, Masato; and Iwakura, Ken, 4,480,052, Cl. 346-208.000.
Saturno, Patrick H.: *See*—
Chang, Hao J.; Popp, Gerhard; and Saturno, Patrick H., 4,480,025, Cl. 430-206.000.
Saunders, Howard E.: *See*—
Dixon, George D.; Saunders, Howard E.; Gause, Smith A.; and Goldberg, Newton N., 4,479,990, Cl. 428-36.000.
Saunders, James E.; and Shotter, Brian A., to Westland plc. Helicopter transmission systems. 4,479,619, Cl. 244-60.000.
Saunders, Jerry M.: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.
Saunders, John B.: *See*—
Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,479,871, Cl. 208-340.000.
Saurer Diederichs (Societe Anonyme): *See*—
Deborde, Albert H.; and Guallo, Max, 4,479,519, Cl. 139-450.000.
Savage, Douglas R., to GNB Batteries Inc. Method and apparatus for assembling battery cell elements. 4,479,300, Cl. 29-623.100.
Savell, Fred B., III: *See*—
Winters, Jonathan K.; and Savell, Fred B., III, 4,479,981, Cl. 427-27.000.
Savoly, Arpad: *See*—
Papalos, John G.; and Savoly, Arpad, 4,479,826, Cl. 106-90.000.
Sawada, Hidekazu: *See*—
Suzuki, Takashi; Okada, Junya; and Sawada, Hidekazu, 4,480,033, Cl. 435-124.000.
Sawada, Toshiaki: *See*—
Koide, Hiroshi; and Sawada, Toshiaki, 4,479,725, Cl. 368-292.000.
Sawaki, Akira; and Nozaki, Hiromi, to Konishiroku Photo Industry Co., Ltd. Automatic shut-off device of a recording apparatus. 4,480,195, Cl. 307-140.000.
Schaaf, Cecil F.; and McIntosh, Russell J., to Kakuris, Paul A. Erosion control device and method of making and installing same. 4,479,740, Cl. 405-30.000.
Schachinger, Adolf: *See*—
Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, 4,479,517, Cl. 139-13.00R.
Schaefer, Louis F.; Kovattana, Termpoon; and Henningson, Tommy, to Esselte Nordia AB. Apparatus for coding and/or decoding a document. 4,480,179, Cl. 235-473.000.
Schaeffer, Barbara J.: *See*—
Shaub, Harold; and Schaeffer, Barbara J., 4,479,883, Cl. 252-32.70E.
Schafer, Helmut; and Unger, Manfred, to Hoechst Aktiengesellschaft. Forgery-resistant film and method of using same. 4,479,996, Cl. 428-212.000.
Schaum-Chemie Wilhelm Bauer G.m.b.H. & Co. KG: *See*—
Baumann, Heinz, 4,480,055, Cl. 521-106.000.
Schellens, E. Peter: *See*—
Ingersoll, Charles S.; and Schellens, E. Peter, 4,479,481, Cl. 126-76.000.
Schempp, Roland: *See*—
Leutner, Volkmar; Haase, Hans J.; Meier, Dietmar; Schempp, Roland; and Pfuhl, Berthold, 4,480,202, Cl. 310-12.000.
Schenck, Timothy T.: *See*—
Coughlin, Michael C.; and Schenck, Timothy T., 4,480,061, Cl. 524-13.000.
Schenk, Walter: *See*—
Schulte-Elte, Karl H.; Becker, Joseph J.; and Schenk, Walter, 4,480,107, Cl. 549-355.000.
Schenz, Anne F., to General Foods Corporation. Amino acids as dry beverage mix ingredients. 4,479,974, Cl. 426-590.000.
Schenz, Anne F.: *See*—
Szczesniak, Alina S.; and Schenz, Anne F., 4,479,975, Cl. 426-590.000.
Schepel, Donald D. Multi-position mooring line apparatus. 4,479,454, Cl. 114-230.000.
Schering Aktiengesellschaft: *See*—
Arndt, Friedrich; Franke, Heinrich; Schmidt, Erich; and Puttner, Reinhold, 4,479,822, Cl. 71-111.000.
Scheurecker, Werner, to Voest-Alpine Aktiengesellschaft. Strand guiding stand to be used in a continuous casting plant. 4,479,529, Cl. 164-442.000.
Schimmel, Gunther: *See*—
von Plessen, Helmold; Gradl, Reinhard; and Schimmel, Gunther, 4,479,924, Cl. 423-321.00R.
Schleimer, Stephen I.: *See*—
Bachman, Brett L.; Belgard, Richard A.; Bernstein, David H.; Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Jones, Thomas M.; Katz, Lawrence H.; Mundie, Craig J.; Pilat, John F.; Schleimer, Stephen I.; Wallach, Steven J.; Wallach, Walter A., Jr.; and Wells, Douglas M., 4,480,306, Cl. 364-200.000.
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, to VEB Chemieanlagenbaukombinat Leipzig-Grimma. Method for the drying and removal of hydrocarbons from gases. 4,479,811, Cl. 55-32.000.
Schlinger, Warren G.: *See*—
Johnson, Everett M.; and Schlinger, Warren G., 4,479,809, Cl. 48-77.000.
Schluderberg, Donald C., to Babcock & Wilcox Company, The. Moving bed heat storage and recovery system. 4,479,353, Cl. 60-659.000.
Schlumberger Technology Corporation: *See*—
Tanguy, Denis R., 4,479,564, Cl. 181-105.000.
Schmid, Karl: *See*—
Grossmann, Horst; Meier, Rolf; and Schmid, Karl, 4,479,555, Cl. 173-171.000.
Schmidt, Erich: *See*—
Arndt, Friedrich; Franke, Heinrich; Schmidt, Erich; and Puttner, Reinhold, 4,479,822, Cl. 71-111.000.

Schmitt, Donald J., to Therm-O-Disc, Incorporated. Trip-free manual reset thermostat. 4,480,246, Cl. 337-348.000.

Schmitt, George P.: *See*—
Appelt, Bernd K.; Schmitt, George P.; and Shipley, John F., 4,479,983, Cl. 427-54.100.

Schnabel, Wilhelm J.: *See*—
Rosin, Michael L.; O'Connor, James M.; Schnabel, Wilhelm J.; and Early, Robert M., 4,480,081, Cl. 528-49.000.

Schoening, Josef; and Schwiers, Hans-Georg, to Hochtemperatur-Reaktorbau GmbH. Concrete cover for high pressure vessels. 4,479,336, Cl. 52-223.00R.

Schoennagel, Hans J.: *See*—
Brennan, James A.; Lucki, Stanley J.; and Schoennagel, Hans J., 4,480,145, Cl. 585-640.000.

Scholl, Hans-Joachim: *See*—
Heitkamper, Peter; Fauss, Rudolf; Findeisen, Kurt; Penninger, Stefan; and Scholl, Hans-Joachim, 4,480,110, Cl. 549-467.000.

Schon, Erwin; Schranz, Karl-Wilhelm; and Wolff, Erich, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material for the production of color images to be viewed by reflected light. 4,480,027, Cl. 430-523.000.

Schonberger, Johann: *See*—
Plammer, Alfred; Weiss, Hermann; Schachinger, Adolf; Schonberger, Johann; Bloo, Johann; and Mistlberger, Bruno, 4,479,517, Cl. 139-13.00R.

Schranz, Karl-Wilhelm: *See*—
Schon, Erwin; Schranz, Karl-Wilhelm; and Wolff, Erich, 4,480,027, Cl. 430-523.000.

Schroder, Gunther: *See*—
Gessinger, Gernot; and Schroder, Gunther, 4,479,833, Cl. 148-11.50R.

Schroeder, Robert W., to RoMark Technology, Inc. Brush for automatic brush cleaning apparatus. 4,479,279, Cl. 15-159.00R.

Schuder, Maurice E., to Emhart Industries, Inc. Light assembly. 4,480,292, Cl. 362-95.000.

Schulte-Elte, Karl H.; Becker, Joseph J.; and Schenk, Walter, to Firmenich SA. Pyranic derivatives useful as intermediates in making muscone. 4,480,107, Cl. 549-355.000.

Schulte, Rolf: *See*—
Nilsson, Kenth; and Schulte, Rolf, 4,479,982, Cl. 427-41.000.

Schulte, Wolfgang: *See*—
Zeidler, Georg; Hansen, Guenter; and Schulte, Wolfgang, 4,479,906, Cl. 260-169.000.

Schuplin, Jerome T., to Fastway Fasteners, Inc. Clips for T-bar grid ceiling arrangement. 4,479,341, Cl. 52-665.000.

Schutt, John B. Silicate binders and coatings. 4,479,824, Cl. 106-14.210.

Schwarzkopf Development Corporation: *See*—
Stricker, Rudolf, 4,479,744, Cl. 407-114.000.

Schweiger, Lonny D. Animal actuated feed and water dispensing apparatus. 4,479,456, Cl. 119-51.500.

Schweikert, Otfried W. Machine for laying shaped bricks. 4,479,739, Cl. 404-99.000.

Schwiers, Hans-Georg: *See*—
Schoening, Josef; and Schwiers, Hans-Georg, 4,479,336, Cl. 52-223.00R.

Schwitters, Steven W.; and Frazer, John M., to Taylor Freezer Company. Continuous-flow type apparatus for pasteurizing batches of product. 4,479,423, Cl. 99-455.000.

Science Union Et Cie: *See*—
Regnier, Gilbert; and Bure, Jacques, 4,479,952, Cl. 424-250.000.

Scientific Pharmaceuticals, Inc.: *See*—
Orlowski, Jan A.; and Butler, David V., 4,479,782, Cl. 433-220.000.

SCM Corporation: *See*—
Ting, Vincent W.; and Marcinko, Richard M., 4,480,058, Cl. 523-404.000.

Scott, Norman; and Hepworth, Paul, to Imperial Chemical Industries PLC. Aldehyde adducts. 4,480,139, Cl. 568-680.000.

Scott, Robert F.: *See*—
McLean, Paul D.; Garton, Andrew; Scott, Robert F.; and Gransden, Susan E., 4,480,082, Cl. 528-103.000.

Sea Savory, Inc.: *See*—
Tolley, Calvert B.; and Tolley, Andrew T., 4,479,284, Cl. 17-71.000.

Sedlacek, Hans-Harald; and Seiler, Friedrich R., to Behringwerke Aktiengesellschaft. Method and agent for the therapy of immunocomplex diseases. 4,479,934, Cl. 424-85.000.

Seemuth, Paul D.: *See*—
Knapp, Gordon G.; Baylerian, Marguerite S.; and Seemuth, Paul D., 4,479,905, Cl. 260-467.000.

Seethanathan, Parakkat: *See*—
Chen, Li F.; and Seethanathan, Parakkat, 4,480,089, Cl. 536-56.000.

Segal, Leonard, to Dotty Smith Corporation, The. Dual-function loose-leaf binder sheets. 4,479,733, Cl. 402-79.000.

Seibert, Karl, to Akzona Incorporated. Polyether derivatives, their use as emulsifiers, and emulsions containing the new polyether derivative. 4,479,887, Cl. 252-309.000.

Seidel, Randy R., to Harris Graphics Corporation. Method and apparatus for transferring newspapers from pockets to an overlapped stream. 4,479,643, Cl. 270-55.000.

Seiki, Kazuo: *See*—
Yasui, Yoshiharu; Seiki, Kazuo; Suzuki, Yoshihisa; and Amano, Hisao, 4,479,348, Cl. 57-404.000.

Seiko Instruments & Electronics Ltd.: *See*—
Shida, Masaharu, 4,479,723, Cl. 368-157.000.

Seiler, Friedrich R.: *See*—
Sedlacek, Hans-Harald; and Seiler, Friedrich R., 4,479,934, Cl. 424-85.000.

Sekiguchi, Katsumi: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.

Sekimoto, Hironobu; and Sato, Norio, to Nissan Motor Company, Limited. Secondary working apparatus. 4,479,294, Cl. 29-159.200.

Sellstrom Manufacturing Company: *See*—
Kubnick, Norman R., 4,479,738, Cl. 403-407.000.

Semiconductor Research Foundation: *See*—
Nisizawa, Jun-ichi; and Fukase, Masaaki, 4,479,845, Cl. 156-601.000.

Senatore, Guy, to Phillips Petroleum Company. Filament rein for cement impregnated with resin of thickenable composition based on an adduct of alkadiene polymers and acid anhydride. 4,479,837, Cl. 156-169.000.

Setoi, Hiroyuki: *See*—
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.

Sette, Paul R.: *See*—
Feinland, Seymour; Freeman, Gerald C.; Viera, Vincent F.; and Sette, Paul R., 4,479,561, Cl. 177-154.000.

Seward, Thomas P., III: *See*—
Borelli, Nicholas F.; Coppola, Frank; Morse, David L.; Nolan, Daniel A.; and Seward, Thomas P., III, 4,479,819, Cl. 65-30.110.

SGS-ATES Componenti Elettronici S.p.A.: *See*—
Graziadei, Rinaldo; and Lorusso, Michelangelo, 4,480,337, Cl. 455-333.000.

Shackle, Peter W.; and Pospisil, Robert S., to Harris Corporation. Phase-to-voltage converter. 4,480,219, Cl. 318-729.000.

Sharp, James L.: *See*—
Morris, Lewis R.; Sullivan, Timothy M.; and Sharp, James L., 4,479,663, Cl. 280-289.00H.

Sharp Kabushiki Kaisha: *See*—
Yano, Tomoyuki; and Maruido, Hiroki, 4,480,316, Cl. 364-900.000.

Sharp, Robert M. Pneumatic valve. 4,479,678, Cl. 297-71.000.

Shaub, Harold; and Schaeffer, Barbara J., to Exxon Research & Engineering Co. Lubricant composition with improved friction reducing properties containing a mixture of dithiocarbamates. 4,479,883, Cl. 252-32.70E.

Shaw, Herbert J.: *See*—
Newton, Steven A.; Bowers, John E.; and Shaw, Herbert J., 4,479,701, Cl. 350-96.160.

Shaw, Joseph R. H. Replicator with slidable pins. 4,480,031, Cl. 435-30.000.

Sheem, Sang K. Optical rotation-sensing interferometer with (3×3)-(2×2) directional coupler. 4,479,715, Cl. 356-350.000.

Shell Internationale Research Maatschappij B. V.: *See*—
Collins, Michael H., 4,479,656, Cl. 277-135.000.

Shell Oil Company: *See*—
Brownscombe, Thomas F., 4,480,005, Cl. 428-336.000.
Closmann, Philip J.; and Wortham, James T., 4,480,039, Cl. 436-175.000.
Johnson, Thomas H., 4,480,049, Cl. 502-231.000.
Willis, Carl L., 4,480,075, Cl. 525-247.000.

Shepard, Charles L.: *See*—
Brown, Roger S.; Shepard, Charles L.; and Richard, Laurey J., 4,479,286, Cl. 19-200.000.

Shepard, Steve A.: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,480,317, Cl. 364-900.000.

Sherman, Louis M.: *See*—
DiPaola, Vincent J.; Collins, William H.; and Sherman, Louis M., 4,479,889, Cl. 252-365.000.

Sherno, Stanley A., to Aperm of South Carolina. Coating composition and method. 4,480,053, Cl. 521-54.000.

Shibata, Akira, to Chugai Denki Kogyo K.K. Ag-Metal oxides electrical contact materials. 4,479,892, Cl. 252-514.000.

Shida, Masaharu, to Seiko Instruments & Electronics Ltd. Analog electronic timepiece drive circuitry for energizing stepping motor drive coil in full and intermediate excitation states, and method therefor. 4,479,723, Cl. 368-157.000.

Shilemay Plastics Products Ltd.: *See*—
Raz, Zeev, 4,479,584, Cl. 211-89.000.

Shimamura, Haruo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus and method for correcting the throttle opening for automotive engines particularly after starting of the engines. 4,479,472, Cl. 123-340.000.

Shimba, Satoru: *See*—
Kato, Kazuo; Watanabe, Yoshikazu; Kumashiro, Kenji; and Shimba, Satoru, 4,480,028, Cl. 430-544.000.

Shimizu, Kazuo, to Ancos Co., Ltd. Writing instrument with sealing cap retained in tip. 4,479,732, Cl. 401-107.000.

Shimizu, Shotaro: *See*—
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, 4,480,010, Cl. 428-457.000.

Shimojo, Yasuaki: *See*—
Kobayashi, Susumu; and Shimojo, Yasuaki, 4,479,797, Cl. 604-153.000.

Shinagawa, Akihiro: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,479,864, Cl. 204-290.00F.

Shipley, Donald A.: *See*—
Lubin, Donald L.; Uebbing, John; Shipley, Donald A.; and Sun, Rickson, 4,479,696, Cl. 350-96.200.

Shipley, John F.: *See*—
Appelt, Bernd K.; Schmitt, George P.; and Shipley, John F., 4,479,983, Cl. 427-54.100.

Shirako, Hideo, to Olympus Optical Company Limited. Casing for receiving cassette. 4,479,580, Cl. 206-387.000.

Shires, Philip J.; Cassata, John R.; Mandelik, Bernard G.; and van Dijk, Christiaan P., to M. W. Kellogg Company, The. Preparation of ammonia synthesis gas. 4,479,925, Cl. 423-359.000.

Shive, Patrick: *See*—
Billotte, Keith; and Shive, Patrick, 4,479,605, Cl. 237-8.00R.

Shoemaker, John V., III. Cork puller. 4,479,406, Cl. 81-3.46A.

Shores, Bobby D., to Jaeger, Ben E. Sampler for slurries. 4,479,393, Cl. 73-863.820.

Shotter, Brian A.: *See*—
Saunders, James E.; and Shotter, Brian A., 4,479,619, Cl. 244-60.000.

Showa Denko Kabushiki Kaisha: *See*—
Ichishima, Fiji; and Onouchi, Takashi, 4,480,037, Cl. 435-221.000.

Shozima, Kazuo, to Trio Kabushkik Kaisha. Level meter circuit. 4,480,221, Cl. 324-96.000.

Shrader, Merrald B.: *See*—
Preist, Donald H.; and Shrader, Merrald B., 4,480,210, Cl. 315-4.000.

Shuster, Frank J. Work surface light. 4,480,295, Cl. 362-206.000.

Shuto, Katsuhiko: *See*—
Hayashi, Masaki; Shuto, Katsuhiko; and Iijima, Yoshitsugu, 4,479,944, Cl. 424-180.000.

Siebert, Elisabeth; Fouletier, Jacques; and Vilminot, Serge, to Societe Nationale Elf Aquitaine. Electrochemical system for measuring the partial oxygen pressure in a gaseous or liquid atmosphere. 4,479,867, Cl. 204-426.000.

Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,479,956, Cl. 424-253.000.

Sieghartner, Leonard J., to Roy E. Roth Company. Multi-stage pump. 4,479,756, Cl. 415-53.00T.

Siemens Aktiengesellschaft: *See*—
Beinvogl, Willy; and Hasler, Barbara, 4,479,850, Cl. 156-643.000.
Irro, Otmar, 4,479,729, Cl. 400-196.100.
Kniepkamp, Hermann, 4,479,829, Cl. 148-1.500.
Nilsson, Kenth; and Schulte, Rolf, 4,479,982, Cl. 427-41.000.
Pfaff, Gerhard; and Wick, Albert, 4,480,301, Cl. 363-137.000.

Signode Corporation: *See*—
Kobiella, Robert J., 4,479,834, Cl. 156-73.500.

Simioni, Francesco, to Safilo S.p.A. Apparatus for producing articles from thermosetting resin. 4,479,769, Cl. 425-434.000.

Simon, Gunter, to Didier-Werke AG. Header brick in regenerator lattice structure. 4,479,777, Cl. 432-179.000.

Simons, Robert M.: *See*—
Brown, William T.; and Simons, Robert M., 4,480,132, Cl. 568-42.000.

Singer Company, The: *See*—
Jacobsen, Robert S., 4,479,384, Cl. 73-253.000.
Jones, Gary D.; Horey, Leonard I.; Kurland, Marvin; and Arnold, Bruce E., 4,479,448, Cl. 112-275.000.
Mallinson, Richard B.; Mecklenborg, Richard A.; Peters, David L.; and Lakshminarayanasetty, Kadam S., 4,479,784, Cl. 434-43.000.

Singer, Wayne J., to Kimberly-Clark Corporation. Bilateral split surgical drape. 4,479,492, Cl. 128-132.00D.

Singhal, Subhash C.: *See*—
McIntyre, William H.; Lau, Sai-Kwing; and Singhal, Subhash C., 4,479,868, Cl. 204-426.000.

Sink, William H.: *See*—
Kummer, Martin E.; Sink, William H.; and Tarlton, James K., 4,479,569, Cl. 192-70.200.

Sipe, Henry C.: *See*—
Mailer, Werner H.; and Sipe, Henry C., 4,479,598, Cl. 226-74.000.

Sivan Development and Implementation of Technological Systems Ltd.: *See*—
Wiesel, Yitzhak, 4,479,775, Cl. 431-353.000.

Ski Tote USA: *See*—
Nordmeyer, Robert, 4,479,674, Cl. 294-147.000.

Skilton, Halsey W.: *See*—
Carlson, Robert E.; and Skilton, Halsey W., 4,479,376, Cl. 72-455.000.

Skoe, Ivar H., to A/S Kongsberg Vapenfabrikk. Compressor boundary layer bleeding system. 4,479,755, Cl. 415-1.000.

Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., to Plastipak Packaging, Inc. In-mold label dispenser for blow molding machine. 4,479,770, Cl. 425-503.000.

Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., to Plastipak Packaging, Inc. In-mold label dispenser for multiple cavity blow molding machine. 4,479,771, Cl. 425-503.000.

Slautterback Corporation: *See*—
Slautterback, Fred A., 4,479,590, Cl. 222-146.500.

Slautterback, Fred A., to Slautterback Corporation. High viscosity material melting and dispensing apparatus. 4,479,590, Cl. 222-146.500.

Small, Charles: *See*—
Miller, Robert R., II; Small, Charles; and Stothoff, John H., 4,480,178, Cl. 235-380.000.

Smith, Carol E. Flat piece folding apparatus with variable speed, and method. 4,479,640, Cl. 270-32.000.

Smith, Donald P. Thermal treatment of food products. 4,479,776, Cl. 432-144.000.

Smith, Frank L., Jr., to Molex Incorporated. Connector assembly. 4,479,691, Cl. 339-59.00M.

Smith, Fritz A., to Mobil Oil Corporation. Regeneration of aromatics processing catalysts. 4,480,144, Cl. 585-481.000.

Smith, Henry I.; and Geis, Michael W., to Massachusetts Institute of Technology. Method of entraining dislocations and other crystalline defects in heated film contacting patterned region. 4,479,846, Cl. 156-603.000.

Smith, Robert S. Resistance exerciser. 4,479,647, Cl. 272-117.000.

Smith, Thomas E.; and Wang, Chih C., to RCA Corporation. Purification of video disc lubricant additives. 4,479,851, Cl. 203-80.000.

SmithKline Beckman Corporation: *See*—
Gilvarg, Charles; and Kingsbury, William D., 4,479,898, Cl. 260-112.50R.

Smiths Industries Public Limited Company: *See*—
Bax, Anton M., 4,480,215, Cl. 318-306.000.

Smits, Karel F. A. A., to Medtronic, Inc. Pacing lead with A-V distance adapter. 4,479,500, Cl. 128-786.000.

SMS Schloemann-Siemag AG: *See*—
Feldmann, Hugo; Illert, Karl; Benz, Willi; and Bohnenkamp, Heinrich, 4,479,374, Cl. 72-236.000.

Snamprogetti S.p.A.: *See*—
Berti, Alfredo; and Ilari, Attilio, 4,479,741, Cl. 405-163.000.

Socha, Louis S., Jr.: *See*—
Allaire, Roger A.; Socha, Louis S., Jr.; and Van Dewoestine, Robert V., 4,479,921, Cl. 422-180.000.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
Kiwior, Denis, 4,479,518, Cl. 139-443.000.

Societe anonyme dite: Machines Chambon: *See*—
Armelin, Michel, 4,479,434, Cl. 101-365.000.

Societe Anonyme dite SAFT: *See*—
de Bellis, Laurent; and Prokopp, Raymond, 4,480,018, Cl. 429-160.000.

Societe d'Assistance Technique Pour Produits Nestle S.A.: *See*—
Hersom, Albert C.; and Wright, Kenneth W., 4,479,758, Cl. 417-388.000.

Societe E. LaCroix: *See*—
Billard, Alain A.; Santalucia, Andre R.; and Encoyand, Roland C., 4,479,417, Cl. 89-1.50D.

Societe Europeenne des Produits Refractaires: *See*—
Blanchet, Pierre; and Recasens, Joseph, 4,479,778, Cl. 432-180.000.

Societe Francaise des Produits Pour Catalyse Pro-Catalyse chez Institute Francais Du Petrole: *See*—
Bournonville, Jean-Paul; and Miquel, Jean, 4,480,048, Cl. 502-227.000.

Societe Nationale de L'Amiante: *See*—
Lalancette, Jean M.; and Hamelin, Hugues, 4,479,828, Cl. 106-308.00B.

Societe Nationale Detude et de Construction de Moteurs D'Aviation: *See*—
Olivier, Jean-Marie R., 4,479,682, Cl. 384-475.000.

Societe Nationale Elf Aquitaine: *See*—
Siebert, Elisabeth; Fouletier, Jacques; and Vilminot, Serge, 4,479,867, Cl. 204-426.000.
Vio, Lino; and Meunier, Gilles, 4,480,067, Cl. 524-446.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Voirin, Robert, 4,479,928, Cl. 423-574.00R.

Sodini, Gregory L., to International Telephone and Telegraph Corporation. Starter circuit for gaseous discharge lamp. 4,480,214, Cl. 315-290.000.

Sollner, Erich: *See*—
Rampf, Rudolf; and Sollner, Erich, 4,480,006, Cl. 428-343.000.

Somodi, John S., to Enercon Systems, Incorporated. Stepped hearth incinerator with positive clean-out of air feed-tubes. 4,479,441, Cl. 110-257.000.

Son, Pyong N.: *See*—
Lai, John T.; and Son, Pyong N., 4,480,092, Cl. 544-113.000.

Sone, Kohki; Nagaishi, Hatsuo; Minami, Hidehiro; Okamura, Kenji; and Kitagasaki, Yoshitaka, to Nissan Motor Company, Limited. Gas sensor with sensitive element enclosed in perforated hood. 4,479,866, Cl. 204-425.000.

Sonntag, Christel: *See*—
Schlicht, Burkhard; Sonntag, Christel; Beise, Hans; Lindner, Otto; Wehner, Klaus; Burk, Werner; Gross, Manfred; and Minak, Hans-Peter, 4,479,811, Cl. 55-32.000.

Sony Corporation: *See*—
Hoshino, Mitsuo; Fukushima, Osamu; and Kakuta, Toshio, 4,479,686, Cl. 339-17.0LC.

Souda, Shigeru: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.

Soukup, Robert J.; and Parliment, Thomas H., to General Foods Corporation. Flavor and mouthfeel character in foodstuffs by the addition of bitter principles. 4,47^,972, Cl. 426-536.000.

Spencer, Donald B.; and Fitc.., John L., to Boeing Company, The. Electronic beam steering methods and apparatus. 4,480,254, Cl. 343-708.000.

Spencer, Maurice: *See*—
Burr, Martin A.; Conroy, Brian G.; and Spencer, Maurice, 4,479,440, Cl. 104-17.00A.

Sperry Corporation: *See*—
Harris, Richard W., 4,480,236, Cl. 333-174.000.
Spiero, Richard C., to U.S. Philips Corporation. PAL Comb filter. 4,480,265, Cl. 358-31.000.
Spong, Fred W.: *See*—
Kalk, Franklin D.; Muchnik, Boris J.; Johnston, Doyle W.; and Spong, Fred W., 4,480,302, Cl. 346-135.100.
Sprague, E. Russell, to Tampax Incorporated. Tampon applicator. 4,479,791, Cl. 604-14.000.
Spriggel, Kenneth A.: *See*—
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,479,381, Cl. 73-66.000.
Springston, Stephen R.: *See*—
Novotny, Milos; Lee, Milton L.; Peaden, Paul A.; Fjeldsted, John C.; and Springston, Stephen R., 4,479,380, Cl. 73-61.10C.
Spurr, William I.: *See*—
Orton, Michael L.; and Spurr, William I., 4,480,079, Cl. 526-301.000.
Stadler, Istva n: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
Stahl, Ronald F. Wear resistant insert for particulate material flow ducts. 4,479,743, Cl. 406-193.000.
Standard Oil Company (Indiana): *See*—
Crowley, Michael S., 4,479,337, Cl. 52-378.000.
Staufer, Dieter: *See*—
Kube, Wolfgang; Kegel, Robert; Valentin, Guenter; and Staufer, Dieter, 4,479,768, Cl. 425-192.00R.
Steelcase Inc.: *See*—
Fries, Bernard J.; Faiks, Frederick S.; and Korell, Donald D., 4,479,679, Cl. 297-300.000.
Steever, Andrew B.; and Vitin, Albert, to Dorr-Oliver, Inc. Pressurized hot cyclone. 4,479,817, Cl. 55-267.000.
Steimel, Richard. Bell-like centrifuge drum for continuously freeing metal turnings of oil. 4,479,789, Cl. 494-43.000.
Steinberg, Hyman A. Rotatable solar-heated water container. 4,479,488, Cl. 126-451.000.
Stern, Theodore J.; and Beachler, Larry A., to AIT Industries, Inc. Lens blocker and method. 4,479,332, Cl. 51-277.000.
Sternberg, Robert L., to United States of America, Navy. Constant beamwidth frequency independent acoustic antenna. 4,480,324, Cl. 367-150.000.
Stewart, Glenn D. Method and apparatus for automatically synchronizing multiple engines. 4,479,357, Cl. 60-719.000.
Stifelman, Jack, to Donaldson Company, Inc. Differential pressure switch. 4,480,160, Cl. 200-82.00R.
Stockton, Thomas R. Concentric powertrain for electric vehicle. 4,479,404, Cl. 74-695.000.
Stone, Roger L.: *See*—
Mustacich, Robert V.; Lucas, Donald S.; and Stone, Roger L., 4,479,795, Cl. 604-53.000.
Storage Technology Corporation: *See*—
Kalk, Franklin D.; Muchnik, Boris J.; Johnston, Doyle W.; and Spong, Fred W., 4,480,302, Cl. 346-135.100.
Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, 4,480,217, Cl. 318-618.000.
Storage Technology Partners: *See*—
Hug, Paul, 4,479,298, Cl. 29-589.000.
Stothoff, John H.: *See*—
Miller, Robert R., II; Small, Charles; and Stothoff, John H., 4,480,178, Cl. 235-380.000.
Stough, Donald M., to Westinghouse Electric Corp. Combustion control system. 4,479,774, Cl. 431-76.000.
Stout, Gregg W.; and Nelson, John A., to Baker Oil Tools, Inc. Subterranean well casing perforating gun. 4,479,556, Cl. 175-4.600.
Strain, Robert J.: *See*—
Varshney, Ramesh C.; and Strain, Robert J., 4,480,199, Cl. 307-303.000.
Strecker, Helmut, to U.S. Philips Corporation. Apparatus for examination by scattered radiation. 4,480,332, Cl. 378-87.000.
Strein, Klaus: *See*—
Wiedemann, Fritz; Michel, Helmut; Weckerle, Wolfgang; Roesch, Egon; and Strein, Klaus, 4,479,962, Cl. 424-273.00N.
Streuber, Hans P., to Julius Montz GmbH. Distributor stage for liquid-contacting columns. 4,479,909, Cl. 261-97.000.
Stricker, Rudolf, to Schwarzkopf Development Corporation. Cutting tool. 4,479,744, Cl. 407-114.000.
Strickland, Jimmy P.: *See*—
Carr, Clarence A.; Huddleston, Robert L.; and Strickland, Jimmy P., 4,480,304, Cl. 364-200.000.
Subbarao, Wunnava V.: *See*—
Ely, Richard I.; and Subbarao, Wunnava V., 4,480,183, Cl. 250-227.000.
Sudo, Michio; and Miura, Hitoshi, to Kangyo Denkikiki Kabushiki Kaisha. Temperature and aging compensated magnetoresistive differential potentiometer. 4,480,248, Cl. 338-32.00R.
Sugatsune Industrial Co. Ltd.: *See*—
Ishii, Hiroyuki, 4,479,566, Cl. 188-1.120.
Sugawara, Toshiyuki: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,479,720, Cl. 366-214.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Sakakibara, Susumu, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus address search. 4,480,280, Cl. 360-78.000.
Suh, John T.: *See*—
Menard, Paul R.; Jones, Howard; and Suh, John T., 4,479,950, Cl. 424-248.500.
Sullivan, Timothy M.: *See*—
Morris, Lewis R.; Sullivan, Timothy M.; and Sharp, James L., 4,479,663, Cl. 280-289.00H.
Sumitomo Chemical Company, Limited: *See*—
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,480,109, Cl. 549-441.000.
Tsushima, Kazunori; Matsuo, Noritada; Hatakoshi, Makoto; Yano, Toshihiko; and Itaya, Nobushige, 4,480,118, Cl. 560-8.000.
Sumitomo Electric Industries, Ltd.: *See*—
Doi, Yoshihiko; Ogasa, Nobuo; Ohtsuka, Akira; and Igarashi, Tadashi, 4,480,013, Cl. 428-616.000.
Sun Electric Corporation: *See*—
Karpowycz, Ihor B., 4,480,191, Cl. 250-343.000.
Sun, Rickson: *See*—
Lubin, Donald L.; Uebbing, John; Shipley, Donald A.; and Sun, Rickson, 4,479,696, Cl. 350-96.200.
Sundstrand Corporation: *See*—
Chetty, P. R. K.; and Fair, Donald G., 4,480,297, Cl. 363-26.000.
Sung, Rodney L.: *See*—
Zoleski, Benjamin H.; and Sung, Rodney L., 4,479,882, Cl. 252-33.400.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgeic Associates. Analgesic compositions comprising propiram and methods of using same. 4,479,956, Cl. 424-253.000.
Sunstar Giken Kabushiki: *See*—
Takegawa, Shuji; and Kunishige, Tadao, 4,479,840, Cl. 156-327.000.
Superba S.A.: *See*—
Gloeckler, Alfred, 4,479,368, Cl. 66-75.200.
Sutryn, Caroll S.: *See*—
Brignola, Dominic J.; Brown, Homer J.; Sutryn, Caroll S.; and Walters, Ralph, 4,479,578, Cl. 206-221.000.
Suzuki, Atsushi; and Ninomiya, Masakazu, to Nippondenso Co., Ltd. Method and apparatus for optimum control of internal combustion engines. 4,479,476, Cl. 123-478.000.
Suzuki, Hiroshi: *See*—
Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, 4,480,000, Cl. 428-284.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishida, Tokuzi, 4,479,470, Cl. 123-308.000.
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,479,469, Cl. 123-308.000.
Suzuki, Mamoru: *See*—
Yamato, Noboru; Hasegawa, Akira; Umeda, Hiroaki; and Suzuki, Mamoru, 4,480,260, Cl. 346-209.000.
Suzuki, Masayuki, to Nippon Seiko Kabushiki Kaisha. Track guide bearing assembly. 4,479,681, Cl. 308-5.00R.
Suzuki, Norimoto; and Hayakawa, Fukuichiro, to Dai Nippon Insatsu Kabushiki Kaisha; and Taihei Kagaku Seihin Kabushiki Kaisha. Plastic card having metallic luster. 4,479,995, Cl. 428-203.000.
Suzuki, Takashi; Okada, Junya; and Sawada, Hidekazu, to Takeda Chemical Industries, Ltd. Lankacidins production. 4,480,033, Cl. 435-124.000.
Suzuki, Toyotosi: *See*—
Tamamura, Hideo; Matsuda, Mutsuhide; Suzuki, Toyotosi; and Endo, Takashi, 4,479,705, Cl. 354-173.100.
Suzuki, Yoshihisa: *See*—
Yasui, Yoshiharu; Seiki, Kazuo; Suzuki, Yoshihisa; and Amano, Hisao, 4,479,348, Cl. 57-404.000.
Svendsen, Lars G., to Pentapharm A.G. Tripeptide derivatives and their application in assaying enzymes. 4,480,030, Cl. 435-13.000.
Swanson, Albert W. Carrying case for portable electronic paging devices. 4,479,596, Cl. 224-236.000.
Swenson, James W., to Vertimag Systems Corporation. Sputtering. 4,479,862, Cl. 204-192.00R.
Syukuri, Kastuhiro; Haneda, Satoshi; and Itaya, Masahiko, to Konishiroku Photo Industry Co., Ltd. Cleaning method for electrophotography and means therefor. 4,479,709, Cl. 355-15.000.
Szczesniak, Alina S.; and Schenz, Anne F., to General Foods Corporation. Fruit flavored beverages. 4,479,975, Cl. 426-590.000.
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T. Inter-m-phenylene-prostacyclin analogues and use thereof in inhibiting blood platelet aggregation. 4,479,945, Cl. 424-184.000.
Szuts, Tamas: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.
T C I Products, Inc.: *See*—
Wyman, James H.; and Wyman, Robert E., 4,479,751, Cl. 414-406.000.
Taguchi, Masayuki, to Amada Company Limited. Method and apparatus for controlling the upper limit of a cutting blade in cutting machines. 4,479,410, Cl. 83-13.000.
Tai, Ho T., to Lever Brothers Company. Detergent compositions. 4,479,881, Cl. 252-8.800.

Taihei Kagaku Seihin Kabushiki Kaisha: *See*—
Suzuki, Norimoto; and Hayakawa, Fukuichiro, 4,479,995, Cl. 428-203.000.

Takada, Keisuke; and Okuhara, Hiroo, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital controller of analog systems containing isolation circuitry and error detection circuitry. 4,480,303, Cl. 364-138.000.

Takagi, Kaname: *See*—
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, 4,479,937, Cl. 424-99.000.

Takahashi, Akira, to Ricoh Company, Ltd. Distance measuring circuit. 4,479,706, Cl. 354-403.000.

Takahashi, Kazuo: *See*—
Kosugi, Masao; Sato, Hiroshi; Takahashi, Kazuo; Ishiyama, Ichiro; and Yabu, Shuichi, 4,479,711, Cl. 355-43.000.

Takahashi, Kenzo; and Sakamoto, Takashi, to Nippon Telegraph & Telephone Public Corp. Echo canceller system. 4,480,156, Cl. 179-170.200.

Takahashi, Teruaki: *See*—
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, 4,480,010, Cl. 428-457.000.

Takasu, Shinichiro: *See*—
Mizutani, Yoshihisa; and Takasu, Shinichiro, 4,479,297, Cl. 29-571.000.

Takata, Harry H., to Ag-Chem Equipment Co., Inc. Manometer apparatus and system for distribution of liquid fertilizers. 4,479,444, Cl. 111-7.000.

Takatsu, Haruyoshi; and Sato, Hisato, to Dainippin InK and Chemicals, Inc. Nematic liquid crystalline compounds. 4,480,117, Cl. 560-1.000.

Takayama, Makoto: *See*—
Fujiki, Makoto; and Takayama, Makoto, 4,480,273, Cl. 360-19.100.

Takeda Chemical Industries, Ltd.: *See*—
Suzuki, Takashi; Okada, Junya; and Sawada, Hidekazu, 4,480,033, Cl. 435-124.000.

Takeda Riken Co. Ltd.: *See*—
Iwasaki, Jun-ichi, 4,480,238, Cl. 333-202.000.

Takegawa, Shuji; and Kunihige, Tadao, to Sunstar Giken Kabushiki. Two-part adhesive and bonding method employing same. 4,479,840, Cl. 156-327.000.

Takehara, Hideaki, to Victor Company of Japan, Ltd. Stylus having a conductive carbon layer. 4,480,326, Cl. 369-173.000.

Takehara, Shigeru, to Motorola Inc. Circuit for reducing offset voltage drift in differential amplifiers. 4,480,231, Cl. 330-261.000.

Takeuchi, Hideo; Horiguchi, Satoru; and Mizuno, Kenichi, to Dai Nippon Insatsu Kabushiki Kaisha. Device for fixing by suction an offset printing plate or like plate in planar state. 4,479,435, Cl. 101-382.0MV.

Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, to Hitachi, Ltd. Fuel cell. 4,480,017, Cl. 429-38.000.

Takura, Toshiyasu; Okada, Tsuneaki; and Kaneko, Eiji, to Tokyo Electric Co., Ltd. Stepping motor. 4,480,203, Cl. 310-42.000.

Talmor, Yehuda: *See*—
Kornmann, Michel; and Talmor, Yehuda, 4,479,891, Cl. 252-512.000.

Tamai, Shigetake. Combustion method and device. 4,479,773, Cl. 431-9.000.

Tamamura, Hideo; Matsuda, Mutsuhide; Suzuki, Toyotosi; and Endo, Takashi, to Canon Kabushiki Kaisha. Film transportation device in camera. 4,479,705, Cl. 354-173.100.

Tampax Incorporated: *See*—
Sprague, E. Russell, 4,479,791, Cl. 604-14.000.

Tamplen, Jack W.; and Young, Carter R., to Otis Engineering Corporation. Downhole lock system. 4,479,539, Cl. 166-212.000.

Tan, Yoichi; and Miyao, Fumio, to Fuji Xerox Co., Ltd. Zero-crossing point detection circuit. 4,480,200, Cl. 307-354.000.

Tanaka, Minoru: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,479,965, Cl. 424-279.000.

Tanguy, Denis R., to Schlumberger Technology Corporation. System and method for monitoring drill string characteristics during drilling. 4,479,564, Cl. 181-105.000.

Tarcy, Gary P., to Aluminum Company of America. Method and apparatus for continuous analysis of a gas and particulate stream. 4,479,379, Cl. 73-23.000.

Tarlton, James K.: *See*—
Kummer, Martin E.; Sink, William H.; and Tarlton, James K., 4,479,569, Cl. 192-70.200.

Tasma, Gerald W., to Grand Rapids Label Company. Labeling mechanism. 4,479,839, Cl. 156-249.000.

Tausig, Wayne R.: *See*—
Inouye, Alan T.; Wilson, Jeffrey V.; Tausig, Wayne R.; and Roe, Thorndyke, Jr., 4,479,690, Cl. 339-94.00C.

Taylor, Chandler R., Jr.: *See*—
Lo, Young S.; and Taylor, Chandler R., Jr., 4,480,100, Cl. 546-307.000.

Taylor Freezer Company: *See*—
Schwitters, Steven W.; and Frazer, John M., 4,479,423, Cl. 99-455.000.

Taylor, Raymond G., to Western Electric Company, Inc. Methods and apparatus for protecting line relay contacts in a telephone switching system. 4,480,152, Cl. 179-81.00R.

Taylor, Robert L.: *See*—
Gibson, Peter H.; and Taylor, Robert L, 4,479,363, Cl. 62-63.000.

Teijin Limited: *See*—
Hagiwara, Tsuneo; and Horike, Akihiro, 4,480,094, Cl. 544-222.000.

Telefunken Electronic GmbH: *See*—
Domland, Christoph; and Minner, Willy, 4,479,479, Cl. 123-630.000.

Tenuta de Azevedo, Andre L., to Usinas Siderurgicas De Minas Gerais S.A. -Usiminas. Method and device to determine interplanar distances in electron diffraction images. 4,480,188, Cl. 250-306.000.

Terahara, Akira; and Tanaka, Minoru, to Sankyo Company, Limited. M-4 and InoM-4 derivatives their preparation and compositions containing them. 4,479,965, Cl. 424-279.000.

Teraji, Tsutomu: *See*—
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.

Terraillon: *See*—
Mairot, Guy; and Aumard, Jean P., 4,479,562, Cl. 177-256.000.

Terry, F. Duncan: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,480,317, Cl. 364-900.000.

Terumo Corporation: *See*—
Kobayashi, Susumu; and Shimojo, Yasuaki, 4,479,797, Cl. 604-153.000.

Texaco Inc.: *See*—
Johnson, Everett M.; and Schlinger, Warren G., 4,479,809, Cl. 48-77.000.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,479,810, Cl. 48-86.00R.
Zoleski, Benjamin H.; and Sung, Rodney L., 4,479,882, Cl. 252-33.400.

Texasgulf, Inc.: *See*—
Bocckino, Harry G.; and Meyer, Jon P., 4,479,790, Cl. 494-85.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,479,793, Cl. 604-85.000.
Urquhart, John; and Theeuwes, Felix, 4,479,794, Cl. 604-85.000.

Theisen GmbH: *See*—
Ganter, Walter, 4,479,816, Cl. 55-230.000.

Theodor Heimeier Metallwerk GmbH: *See*—
Kasprik, Manfred; Mintert, Paul; and Werner, Klaus, 4,479,505, Cl. 137-15.000.

Theodore, Ares N.; and Chattha, Mohinder S., to Ford Motor Company. Non-aqueous dispersions based on capped stabilizers and vinyl monomers I. 4,480,069, Cl. 524-504.000.

Therm-O-Disc, Incorporated: *See*—
Schmitt, Donald J., 4,480,246, Cl. 337-348.000.

Theurer, Josef; and Brunninger, Manfred, to Franz Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile arrangement and method for improving a track bed. 4,479,439, Cl. 104-7.00R.

Thiel, Charles G., to Riker Laboratories, Inc. Hypodermic syringe containing microfibers of an amorphous heparin salt. 4,479,799, Cl. 604-187.000.

Thoma, Martin; and Buenger, Paul, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Galvanic dispersion deposition bath. 4,479,855, Cl. 204-16.000.

Thomas & Betts Corporation: *See*—
Greenwood, William S.; Weinmann, Karl; and Weindel, Reinhold, 4,479,692, Cl. 339-99.00R.

Thomas, Patrick D. P.: *See*—
Postle, Stephen R.; and Thomas, Patrick D. P., 4,480,104, Cl. 549-71.000.

Thomas, William R., to Baxter Travenol Laboratories, Inc. Therapeutic composition containing factor VIIa. 4,479,938, Cl. 424-101.000.

Thompson, Daniel G.; and Chan, Siu-Kee, to Westinghouse Electric Corp. Shrink fit sleeve for rotating machinery. 4,479,735, Cl. 403-28.000.

Thompson, Fred E., to AT&T Technologies, Inc. Plastic coated laminate. 4,479,991, Cl. 428-76.000.

Thompson, George H. B., to International Standard Electric Corporation. Injection laser with an inverted waveguiding rib. 4,480,331, Cl. 372-45.000.

Thomson CSF: *See*—
Orieux, Francois; and Bertheas, Jean, 4,480,322, Cl. 367-123.000.

Thomson, David M.: *See*—
Kordomenos, Panagiotis I.; Alexander, Delores J.; and Thomson, David M., 4,480,084, Cl. 528-118.000.

Thorley, Graham R., to Transportation Design & Technology, Inc. Wheelchair lift for passenger vehicles. 4,479,753, Cl. 414-541.000.

Thyssen Stahl Aktiengesellschaft: *See*—
Fernandez, Jose ; Herm, Jurgen; Krakow, Heinz; Tomsen, Harald; and Wortmann, Ernst, deceased, 4,479,602, Cl. 228-48.000.

TI (Group Services) Limited: *See*—
Whittington, Keith R., 4,479,531, Cl. 164-504.000.

Tihanyi, Karoly: *See*—
Szekely, Istvan; Bota r, Sa ndor; Lovasz, Marianna G.; Dolgos, Krisztina K.; Kovacs, Gabor; Virag, Sandor; Szuts, Tamas; Rakoczi, Istva n; Tihanyi, Karoly; Kormoczy, Peter; Hadhazy, Pal; Stadler, Istva n; Blasko, Gyorgy; and Koszegi, Bela, 4,479,945, Cl. 424-184.000.

Tillbrook, Anthony A. C. Sportman's waterproof suit. 4,479,268, Cl. 2-2.10R.

Timokhina, Valeria I.: *See*—
Akimova, Alla Y.; Buyanov, Valentin M.; Galperin, Eduard I.; Davydov, Anatoly B.; Derkach, Galina M.; Derevyanko, Vitaly P.; Keshelava, Viktor V.; Malyarova, Larisa P.; Rusakov, Igor G.; Timokhina, Valeria I.; and Chissov, Valery I., 4,479,933, Cl. 424-81.000.

Tincati, Franco. Device for feeding-in and moving-on containers to and from a rotary capping unit. 4,479,343, Cl. 53-287.000.
Ting, Vincent W.; and Marcinko, Richard M., to SCM Corporation. Aqueous epoxy ester emulsions. 4,480,058, Cl. 523-404.000.
Tinker, Craig S.; and Haberer, Thomas G., to Pall Corporation. Pneumatic controller and alarm for adsorbent fractionaters, particularly dessicant dryers. 4,479,815, Cl. 55-163.000.
Tippetts, John R., to United Kingdom Atomic Energy Authority. Fluidic control devices. 4,479,515, Cl. 137-824.000.
Tobita, Hiroshi: *See*—
Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, 4,480,017, Cl. 429-38.000.
Todd, Robert E. Motor vehicle adapted for disabled driver. 4,479,752, Cl. 414-462.000.
Toftness, Irwing N. Method of spinal radiometer analysis and corrective adjustment. 4,479,498, Cl. 128-653.000.
Togawa, Fumio; Karashima, Takato; and Zaitsu, Hiroshi, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,480,004, Cl. 428-329.000.
Toho Seiko Co., Ltd.: *See*—
Kanamaru, Takayoshi, 4,479,683, Cl. 384-619.000.
Tojo, Toru; Mori, Ichiro; and Sano, Shunichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic chuck plate. 4,480,284, Cl. 361-234.000.
Tokuda, Ryuji, to Canon Kabushiki Kaisha. Temperature compensation system of light measuring circuit. 4,479,708, Cl. 354-427.000.
Tokyo Electric Co., Ltd.: *See*—
Kawaguchi, Katsuhiko, 4,479,731, Cl. 400-320.000.
Takura, Toshiyasu; Okada, Tsuneaki; and Kaneko, Eiji, 4,480,203, Cl. 310-42.000.
Tokyo Sanyo Electric Co.: *See*—
Kishi, Hiroyasu, 4,480,335, Cl. 455-212.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hashimoto, Kiyoshi, 4,480,185, Cl. 250-251.000.
Hashimoto, Yasuichi, 4,480,279, Cl. 360-78.000.
Hayase, Shuzi; and Onishi, Yasunobu, 4,479,860, Cl. 204-159.110.
Koshino, Yutaka; Ohshima, Jiro; Ajima, Takashi; and Yonezawa, Toshio, 4,479,830, Cl. 148-1.500.
Mizutani, Yoshihisa; and Takasu, Shinichiro, 4,479,297, Cl. 29-571.000.
Takada, Keisuke; and Okuhara, Hiroo, 4,480,303, Cl. 364-138.000.
Tojo, Toru; Mori, Ichiro; and Sano, Shunichi, 4,480,284, Cl. 361-234.000.
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, 4,480,269, Cl. 358-209.000.
Tolley, Andrew T.: *See*—
Tolley, Calvert B.; and Tolley, Andrew T., 4,479,284, Cl. 17-71.000.
Tolley, Calvert B.; and Tolley, Andrew T., to Sea Savory, Inc. Crab processing machine. 4,479,284, Cl. 17-71.000.
Tolson, Raymond C. Method and apparatus for drying cereal grain. 4,479,309, Cl. 34-13.000.
Tomsen, Harald: *See*—
Fernandez, Jose ; Herm, Jurgen; Krakow, Heinz; Tomsen, Harald; and Wortmann, Ernst, deceased, 4,479,602, Cl. 228-48.000.
Tonami, Munehiko: *See*—
Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Tobita, Hiroshi; and Tonami, Munehiko, 4,480,017, Cl. 429-38.000.
Tong, Yulan C., to Dow Chemical Company, The. Methods and compositions for inhibiting herpes virus using pyridinyl ketones. 4,479,958, Cl. 424-266.000.
Toppan Printing Co., Ltd.: *See*—
Masaki, Tatsuo; Nishimoto, Toyoshi; and Masui, Kiyoshi, 4,479,432, Cl. 101-170.000.
Torftech Limited: *See*—
Dodson, Christopher E., 4,479,920, Cl. 422-143.000.
Torrington Company, The: *See*—
De Bisschop, James G., 4,479,786, Cl. 464-89.000.
Tortorello, Anthony J.; and Hansen, Nestor P., to DeSoto, Inc. Oxazolidine-blocked amine polymers. 4,480,083, Cl. 528-111.000.
Touchton, James: *See*—
Robbins, David C.; Haldeman, David; Hill, John P.; Sander, Charles; and Touchton, James, 4,480,217, Cl. 318-618.000.
Townsend, Herbert E.: *See*—
Hart, Robert G.; and Townsend, Herbert E., 4,479,832, Cl. 148-6.14R.
Townsend, Perry J., to Merck & Co., Inc. Apparatus for calibrating surface temperature measuring devices. 4,479,726, Cl. 374-1.000.
Toyo Kizai Kabushiki Kaisha: *See*—
Okumura, Shuichi; and Satoh, Yutaka, 4,479,607, Cl. 238-349.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kondou, Masatsune; Itou, Kazuhiro; and Furuta, Tsutomu, 4,480,170, Cl. 219-125.100.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kondo, Toshio; Norimatsu, Hideaki; Nakamura, Mitsuo; Masuda, Akira; and Kitazima, Sigenori, 4,479,464, Cl. 123-489.000.
Trans-World Manufacturing Corporation: *See*—
Franklin, Robert P.; and Dewees, John G., 4,479,583, Cl. 211-49.00D.
Transportation Design & Technology, Inc.: *See*—
Thorley, Graham R., 4,479,753, Cl. 414-541.000.
TransTechnology Corporation: *See*—
Huber, John R., 4,479,746, Cl. 410-21.000.
Treanor, Anthony I. J., to Permutit-Boby Limited. Method and apparatus for deflecting granular material away from the outlet of a filtration bed. 4,479,880, Cl. 210-795.000.
Trenholm, Bruce W.: *See*—
Martin, Michael A.; Trenholm, Bruce W.; and Woolley, James G., 4,479,624, Cl. 244-152.000.
Trio Kabushkik Kaisha: *See*—
Shozima, Kazuo, 4,480,221, Cl. 324-96.000.
Trotter, Jimmy R.; Joyner, Frederick B.; and McConnell, Richard L., to Eastman Kodak Company. Polyester waxes based on alkylsuccinic anhydride or alkenylsuccinic anhydride. 4,480,087, Cl. 528-302.000.
Trouyez, Gerard, to Biomerieux. Process for the preparation of toxoplasmas for the diagnosis of toxoplasmosis, and preparations thus obtained. 4,480,043, Cl. 436-536.000.
Tsubakimoto Chain Company: *See*—
Ishikura, Takashi; Mino, Joji; Sato, Kiyomi; and Nagato, Takaaki, 4,480,157, Cl. 191-34.000.
Tsubouchi, Kaoru; and Funahashi, Akira, to Aisin Seiki Kabushiki Kaisha. Float stopper attaching method in liquid level sensor. 4,479,915, Cl. 264-249.000.
Tsujimoto, Michihiro: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,480,002, Cl. 428-402.200.
Tsumura, Minoru: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,479,720, Cl. 366-214.000.
Tsushima, Kazunori; Matsuo, Noritada; Hatakoshi, Makoto; Yano, Toshihiko; and Itaya, Nobushige, to Sumitomo Chemical Company, Limited. Carboxylic acid ester and an insecticidal and/or acaricidal composition containing the same. 4,480,118, Cl. 560-8.000.
Tsuyama Mfg. Co., Ltd.: *See*—
Uyeda, Takashi; and Matsumoto, Masaaki, 4,479,693, Cl. 339-119.00R.
Tucci, Charles A., to Cordis Corporation. Mechanically self-sealing closure. 4,479,489, Cl. 128-419.00P.
Tugwood, Geoffrey D.: *See*—
Tugwood, Ian D.; and Tugwood, Geoffrey D., 4,479,785, Cl. 441-75.000.
Tugwood, Ian D.; and Tugwood, Geoffrey D. Leg rope for a surfboard. 4,479,785, Cl. 441-75.000.
Turgeon, Harry S., to Valley Engineering, Inc. Foldable snow compactor with side wings pivotable behind central blade. 4,479,312, Cl. 37-219.000.
Uarco Incorporated: *See*—
Johnson, Marland R.; and Nauheimer, Donald J., 4,479,597, Cl. 225-100.000.
Uchida, Itsuo: *See*—
Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, 4,479,942, Cl. 424-180.000.
Uebbing, John: *See*—
Lubin, Donald L.; Uebbing, John; Shipley, Donald A.; and Sun, Rickson, 4,479,696, Cl. 350-96.200.
Uhlmann, Jack. Screw-and-nut unit or screw joint. 4,479,748, Cl. 411-412.000.
Umbach, Newell L.; and Boyer, William J. Retractable glycol spray nozzle. 4,479,612, Cl. 239-280.000.
Umeda, Hiroaki: *See*—
Yamato, Noboru; Hasegawa, Akira; Umeda, Hiroaki; and Suzuki, Mamoru, 4,480,260, Cl. 346-209.000.
Umehara, Akira: *See*—
Kondo, Syunichi; Sato, Hideo; Honjo, Satoru; and Umehara, Akira, 4,480,020, Cl. 430-81.000.
Umezawa, Hamao; Kondo, Shinichi; and Ikeda, Daishiro, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 3-Demethoxyistamycin B, the 2''-N-formimidoyl derivative thereof and pharmaceutical composition containing same. 4,479,943, Cl. 424-180.000.
Unger, Manfred: *See*—
Schafer, Helmut; and Unger, Manfred, 4,479,996, Cl. 428-212.000.
Union Carbide Corporation: *See*—
Hodakowski, Leonard E.; and Bushey, Dean F., 4,479,946, Cl. 424-200.000.
Mallon, Charles B., 4,480,072, Cl. 525-61.000.
Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,479,871, Cl. 208-340.000.
Union Oil Company of California: *See*—
Kalfayan, Leonard J.; and Watkins, David R., 4,479,543, Cl. 166-300.000.
Union Special GmbH: *See*—
Rohr, Gunter H., 4,479,447, Cl. 112-141.000.
Uniroyal, Inc.: *See*—
Paeglis, Arnis U., 4,480,062, Cl. 524-394.000.
United Aircraft Products, Inc.: *See*—
Haushalter, Frederick W.; Coughlin, Stanley J.; and Pervaiz, Khalid, 4,480,165, Cl. 219-85.00R.
United Kingdom Atomic Energy Authority: *See*—
Tippetts, John R., 4,479,515, Cl. 137-824.000.
United States of America
Administrator Environmental Protection Agency: *See*—
Guter, Gerald A., 4,479,877, Cl. 210-670.000.
Agriculture: *See*—
Brown, Roger S.; Shepard, Charles L.; and Richard, Laurey J., 4,479,286, Cl. 19-200.000.
Owens, Robert A.; and Diener, Theodor O., 4,480,040, Cl. 436-504.000.
Army: *See*—
Berg, Richard M., 4,479,994, Cl. 428-195.000.

DiPaola, Vincent J.; Collins, William H.; and Sherman, Louis M., 4,479,889, Cl. 252-365.000.
McDonald, Joseph K.; and Merritt, James A., 4,479,859, Cl. 204-158.00R.
Palazzolo, Faro D.; Magnuson, Roland A.; and Aoki, Earl S., 4,479,568, Cl. 192-67.00R.
Energy: *See*—
Adcock, James L.; Pace, Marshall O.; and Christopherou, Loucas G., 4,480,147, Cl. 174-14.00R.
Christiansen, David W.; and Brown, William F., 4,480,171, Cl. 219-136.000.
Koehler, Dale R., 4,479,385, Cl. 73-517.00R.
Lambrecht, Richard M.; and Packer, Samuel, 4,479,931, Cl. 424-1.100.
McDougal, Allan R.; and Hale, Robert R., 4,479,485, Cl. 126-439.000.
Nance, Roy A.; Hartley, William H.; and Caffarel, Alfred J., 4,480,225, Cl. 324-238.000.
Osher, John E., 4,479,361, Cl. 62-55.500.
Wagner, Thomas A.; and Engel, Herbert P., 4,479,387, Cl. 73-622.000.
National Aeronautics and Space Administration: *See*—
Beggs, James M.; Johnston, Garland D.; Coleman, Archie D.; Portwood, Joseph N.; Saunders, Jerry M.; Redmon, John W.; and Porter, Allen C., 4,479,386, Cl. 73-582.000.
Day, Richard M., 4,479,560, Cl. 177-147.000.
Navy: *See*—
Inouye, Alan T.; Wilson, Jeffrey V.; Tausig, Wayne R.; and Roe, Thorndyke, Jr., 4,479,690, Cl. 339-94.00C.
Malakhoff, Alexander, 4,479,378, Cl. 73-12.000.
Martin, Michael A.; Trenholm, Bruce W.; and Woolley, James G., 4,479,624, Cl. 244-152.000.
Page, Robert E., 4,480,323, Cl. 367-131.000.
Parks, Albert R., 4,480,056, Cl. 523-122.000.
Sternberg, Robert L., 4,480,324, Cl. 367-150.000.
U.S. Philips Corporation: *See*—
Hill, Bernhard, 4,480,257, Cl. 346-107.00R.
Laursema, Meerten, 4,480,300, Cl. 363-134.000.
Spiero, Richard C., 4,480,265, Cl. 358-31.000.
Strecker, Helmut, 4,480,332, Cl. 378-87.000.
van den Avoort, Pieter M.; and van Buul, Marinus C. W., 4,480,267, Cl. 358-140.000.
Van Kessel, Theodorus J.; Franssen, Nico V., deceased; and de Haan, Friedrich J., administrator, 4,480,229, Cl. 330-84.000.
van Merode, Peter C. A., 4,480,263, Cl. 358-3.000.
United Technologies Corporation: *See*—
Miller, John A.; Anderson, Ralph E.; and Allen, Marvin M., 4,479,293, Cl. 29-156.80R.
Pike, Roscoe A., 4,480,088, Cl. 528-353.000.
Unitek Corporation: *See*—
Boettcher, Ralph A., 4,479,527, Cl. 164-34.000.
University of Florida: *See*—
Bodor, Nicholas S., 4,479,932, Cl. 424-9.000.
University of Massachusetts, Trustees of the: *See*—
Hnatowich, Donald J., 4,479,930, Cl. 424-1.100.
University of Rochester, The: *See*—
Albrecht, Georg F.; and Mourou, Gerard, 4,480,192, Cl. 250-550.000.
Unterleitner, Fred C.: *See*—
Kapany, Narinder S.; and Unterleitner, Fred C., 4,479,697, Cl. 350-96.180.
UOP Inc.: *See*—
Brennan, John F., 4,480,050, Cl. 502-330.000.
Priegnitz, James W.; and Zinnen, Hermann A., 4,480,129, Cl. 564-424.000.
Rosen, Bruce I., 4,479,902, Cl. 260-409.000.
Upjohn Company, The: *See*—
Boscher, Filippus; Penfold, John; Reich, Klaus W.; and Zandvoort, Albertus, 4,480,070, Cl. 524-591.000.
Hester, Jackson B., Jr., 4,479,959, Cl. 424-269.000.
Urquhart, John; and Theeuwes, Felix, to Alza Corporation. Parenteral administration using drug delivery device. 4,479,793, Cl. 604-85.000.
Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. System for intravenous therapy. 4,479,794, Cl. 604-85.000.
Usinas Siderurgicas De Minas Gerais S.A. -Usiminas: *See*—
Tenuta de Azevedo, Andre L., 4,480,188, Cl. 250-306.000.
USM Corporation: *See*—
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,479,446, Cl. 112-121.120.
Usuki, Kazuyasu: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Sakabe, Naoko; and Kawashima, Hidetoshi, 4,479,954, Cl. 424-251.000.
USV Pharmaceutical Corporation: *See*—
Menard, Paul R.; Jones, Howard; and Suh, John T., 4,479,950, Cl. 424-248.500.
Uyeda, Takashi; and Matsumoto, Masaaki, to Tsuyama Mfg. Co., Ltd. Device for detachably attaching electric appliances. 4,479,693, Cl. 339-119.00R.
Valentin, Guenter: *See*—
Kube, Wolfgang; Kegel, Robert; Valentin, Guenter; and Staufer, Dieter, 4,479,768, Cl. 425-192.00R.
Valeo: *See*—
Jacquet, Maurice, 4,479,668, Cl. 285-137.00R.
Valley Engineering, Inc.: *See*—
Turgeon, Harry S., 4,479,312, Cl. 37-219.000.
Valli & Colombo S.p.A.: *See*—
Colombo, Angelo, 4,479,671, Cl. 292-169.140.
van Buul, Marinus C. W.: *See*—
van den Avoort, Pieter M.; and van Buul, Marinus C. W., 4,480,267, Cl. 358-140.000.
Vance, Ian A. W., to International Standard Electric Corporation. Single channel duplex communication system. 4,480,327, Cl. 370-27.000.
Vandale, Leonard A.: *See*—
Greenhorn, Richard J.; Dutt, William R.; Vandale, Leonard A.; Winslow, Douglas L.; Glemming, David A.; Muhl, John S.; Heisler, Michael G.; and Brown, Jack E., Jr., 4,479,382, Cl. 73-146.000.
van den Avoort, Pieter M.; and van Buul, Marinus C. W., to U.S. Philips Corporation. Line standard conversion circuit. 4,480,267, Cl. 358-140.000.
Vandenbergh, Peter A.; and Gonzalez, Carlos F., to Microlife Technics, Inc. Method for protecting the growth of plants employing mutant siderophore producing strains of *Pseudomonas Putida*. 4,479,936, Cl. 424-93.000.
Van Dewoestine, Robert V.: *See*—
Allaire, Roger A.; Socha, Louis S., Jr.; and Van Dewoestine, Robert V., 4,479,921, Cl. 422-180.000.
van Dijk, Christiaan P.: *See*—
Shires, Philip J.; Cassata, John R.; Mandelik, Bernard G.; and van Dijk, Christiaan P., 4,479,925, Cl. 423-359.000.
Van Dorn, Warren G.: *See*—
Masterson, David C.; and Van Dorn, Warren G., 4,479,997, Cl. 428-212.000.
Van Kessel, Theodorus J.; Franssen, Nico V., deceased; and by de Haan, Friedrich J., administrator, to U.S. Philips Corporation. Amplifier arrangement with parallel-operated amplifier sections. 4,480,229, Cl. 330-84.000.
van Merode, Peter C. A., to U.S. Philips Corporation. Three-dimensional television system and transmitter suitable therefor. 4,480,263, Cl. 358-3.000.
Van Raalte, Peter: *See*—
MacPhee, John; and Van Raalte, Peter, 4,479,433, Cl. 101-364.000.
van Rensburg, Philippus J.: *See*—
Hyman, William B.; Hoy, John; and van Rensburg, Philippus J., 4,479,968, Cl. 424-330.000.
Varco International, Inc.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,479,547, Cl. 166-383.000.
Varian Associates, Inc.: *See*—
Gerard, William A., 4,480,235, Cl. 331-91.000.
Preist, Donald H.; and Shrader, Merrald B., 4,480,210, Cl. 315-4.000.
Varshney, Ramesh C.; and Strain, Robert J., to Fairchild Camera & Instrument Corp. Identification of repaired integrated circuits. 4,480,199, Cl. 307-303.000.
Vaughan, Quentin D., to Visual Graphics Corporation. Apparatus for storing, transporting and exposing photosensitive film for camera. 4,479,710, Cl. 355-28.000.
Vaught, John L.: *See*—
Kruger, William P.; and Vaught, John L., 4,480,259, Cl. 346-140.00R.
VEB Chemieanlagenbaukombinat Leipzig-Grimma: *See*—
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Veber, Daniel F.; Boger, Joshua S.; and Bock, Mark G., to Merck & Co., Inc. Renin inhibitory peptides having $PHE^{13}$ delection. 4,479,941, Cl. 424-177.000.
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Wagstaff, Alvin J. Sliding and pivoting invertible grill. 4,479,422, Cl. 99-395.000.

Wakimura, Kakuichi, to Mitsuwa Kogyo Co., Ltd. Electric car with winch having automatic shutoff. 4,479,327, Cl. 446-427.000.

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Wang, Fun-Den. Method and apparatus for recovery of oil, gas and mineral deposits by panel opening. 4,479,541, Cl. 166-268.000.

Wang, Kenneth Y., to Burlington Industries, Inc. Full counterflow mini-bath open-width fabric washer. 4,479,370, Cl. 68-22.00R.

Wang, Yun L., to Monsanto Company. Process for preparing elastoplastic compositions. 4,480,074, Cl. 525-194.000.

Warchol, Mark P.; and Gale, Walter W., to Exxon Production Research Co. Enhanced oil recovery process utilizing a lignosulfonate as a solubilizing agent in an afterflush. 4,479,542, Cl. 166-273.000.

Ward, Arthur T. Asphalt compositions. 4,479,827, Cl. 106-281.00R.

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Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, to Lion Corporation; and Anne Company, Ltd. Absorbent article. 4,480,000, Cl. 428-284.000.

Watanabe, Masahiro, to Kabushiki Kaisha Komatsu Seisakusho. A system for controlling a hydraulic cooling fan for an engine as a function of ambient and coolant temperatures. 4,479,532, Cl. 165-39.000.

Watanabe, Shunso F., to Ford Motor Company. Anti-jamming mechanism for linear translatory device. 4,479,398, Cl. 74-89.150.

Watanabe, Yasuo, to Dai-Ichi High Frequency Co., Ltd. Method of manufacturing metallic bent pipe. 4,479,372, Cl. 72-128.000.

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Weigl, Richard. Fork bar for motorcycles. 4,479,661, Cl. 280-279.000.

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Wells, Peggy S., to PSW, Inc. Lighted sweat shirt. 4,480,293, Cl. 362-108.000.

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Welstead, Robert F. Night fishing light. 4,479,321, Cl. 43-17.000.

Wendl, Daniel P.; and Lukezich, Paul J., to Applied Power Inc. Measuring bridge. 4,479,305, Cl. 33-180.0AT.

Wernecke, Heinz, to Liberty Die Casting Company. Interlocking mold assembly. 4,479,630, Cl. 249-142.000.

Werner, John A., to Dow Chemical Company, The. 2,3-Difluoro-5-(trifluoromethyl)pyridine and methods of making and using the same. 4,480,102, Cl. 546-345.000.

Werner, Klaus: *See—*
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Wiesel, Yitzhak, to Sivan Development and Implementation of Technological Systems Ltd. Vane structure burner for improved air-fuel combustion. 4,479,775, Cl. 431-353.000.
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Wilkinson, Richard L., to Discovision Associates. Audio/video signal recording method. 4,480,270, Cl. 358-310.000.
Will, Walter, to Westinghouse FANAL-Schaltgerate GmbH. Time delay switching device. 4,480,158, Cl. 200-34.000.
Willans, Robert D. H.; Baggio, Edward G.; Harper, Harold K.; Mawer, Eric L.; Manwell, Robert E.; and Reeves, George H., to Cominco Ltd. Method and apparatus for stripping cathodes. 4,479,854, Cl. 204-12.000.
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Williams, Donald J.: *See*—
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Willis, Carl L., to Shell Oil Company. Block copolymers of Ziegler-Natta polymerized and anionically polymerized monomers. 4,480,075, Cl. 525-247.000.
Willis, Ward L. Drum support assembly. 4,479,414, Cl. 84-421.000.
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Yamashita, Michio; Komori, Tadaaki; Hosoda, Junji; Kawai, Yoshio; Uchida, Itsuo; Kohsaka, Masanobu; Imanaka, Hiroshi; Sakane, Kazuo; Setoi, Hiroyuki; and Teraji, Tsutomu, to Fujisawa Pharmaceutical Co., Ltd. Tetrahydrofurnancarboxylic acid derivatives, processes for preparation thereof and pharmaceutical compositions thereof. 4,479,942, Cl. 424-180.000.
Yamato, Noboru; Hasegawa, Akira; Umeda, Hiroaki; and Suzuki, Mamoru, to Jujo Paper Co., Ltd. Color-developing sheet for pressure-sensitive recording sheets. 4,480,260, Cl. 346-209.000.
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Yano, Toshihiko: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Hatakoshi, Makoto; Yano, Toshihiko; and Itaya, Nobushige, 4,480,118, Cl. 560-8.000.
Yarmchuk, Edward J.: *See*—
Acosta, Raul E.; and Yarmchuk, Edward J., 4,479,980, Cl. 427-10.000.
Yasui, Yoshiharu; Seiki, Kazuo; Suzuki, Yoshihisa; and Amano, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki. Apparatus for spinning fasciated yarn. 4,479,348, Cl. 57-404.000.
Yates, Ronald L., to Dow Chemical Company, The. Photoactivated catalytic polymerization of monoepoxides. 4,479,858, Cl. 204-158.00R.
Yazaki Corporation: *See*—
Mikami, Hitoshi; and Ito, Noboru, 4,479,407, Cl. 81-9.510.
Ybema, Douwe: *See*—
Honey, Ronald N.; Manwell, Robert E.; Krauss, Clifford J.; and Ybema, Douwe, 4,479,863, Cl. 204-279.000.
Yenetchi, George V.: *See*—
Guide, John J.; Carey, Joseph E., Jr.; Eichamer, Paul D.; Claypole, George; and Yenetchi, George V., 4,479,355, Cl. 60-683.000.
Yokoyama, Hiroshi: *See*—
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,479,469, Cl. 123-308.000.
Yokoyama, Naokata, to Ciba-Geigy Corporation. Heterocycle-fused pyrazolo[3,4-d]pyridin-3-ones as benzodiazepine receptor modulators. 4,479,955, Cl. 424-251.000.
Yonezawa, Toshio: *See*—
Koshino, Yutaka; Ohshima, Jiro; Ajima, Takashi; and Yonezawa, Toshio, 4,479,830, Cl. 148-1.500.
Yoshida Kogyo K. K.: *See*—
Osaki, Tatsuo, 4,479,290, Cl. 29-33.200.
Yoshida, Nobuaki; Mori, Yoshio; Ooi, Kazushige; and Sakai, Sumio, to Nippon Kogaku K.K.; and Tokyo Shibaura Denki Kabushiki Kaisha. Television camera. 4,480,269, Cl. 358-209.000.
Yoshihara, Akio: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yoshihara, Akio; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,480,065, Cl. 524-418.000.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Sakakibara, Susumu, 4,480,280, Cl. 360-78.000.
Yoshii, Junji: *See*—
Watanabe, Isao; Kashiwada, Toshinobu; Suzuki, Hiroshi; and Yoshii, Junji, 4,480,000, Cl. 428-284.000.
Yoshikawa, Youji: *See*—
Sasanuma, Yasutomo; Koshi, Masao; Takahashi, Teruaki; Shimizu, Shotaro; Enomoto, Mitsugu; and Yoshikawa, Youji, 4,480,010, Cl. 428-457.000.
Yoshino America Corporation: *See*—
Haryu, Koichi, 4,479,429, Cl. 101-38.00A.
Yoshioka, Satoru; Namekawa, Takumi; and Mitsuki, Iwao, to Ricoh Company, Ltd. Ribbon cartridge. 4,479,730, Cl. 400-208.000.
Yoshizawa, Tetsuo: *See*—
Kurokawa, Takashi; Yoshizawa, Tetsuo; and Nara, Shigeo, 4,479,910, Cl. 264-2.500.
Young, Carter R.: *See*—
Tamplen, Jack W.; and Young, Carter R., 4,479,539, Cl. 166-212.000.
Yugen Kaisha Fuji Seisakusho: *See*—
Yamada, Teruo, 4,479,844, Cl. 156-583.200.
Yuki, Yoshikazu: *See*—
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, 4,479,937, Cl. 424-99.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Rieger, Wolfgang, 4,479,400, Cl. 74-422.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Marschner, Heinz; Heinemann, Fritz; and Marsland, George, 4,479,403, Cl. 74-640.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Kondo, Shinichi; and Ikeda, Daishiro, 4,479,943, Cl. 424-180.000.
Zaitsu, Hiroshi: *See*—
Togawa, Fumio; Karashima, Takato; and Zaitsu, Hiroshi, 4,480,004, Cl. 428-329.000.
Zandvoort, Albertus: *See*—
Bosscher, Filippus; Penfold, John; Reich, Klaus W.; and Zandvoort, Albertus, 4,480,070, Cl. 524-591.000.
Zankl, Kurt O., to General Motors Corporation. Lid arrangement for luggage compartment. 4,479,675, Cl. 296-37.160.
Zeagler, L. D.: *See*—
Hackman, E. B.; and Zeagler, L. D., 4,480,138, Cl. 568-454.000.
Zeidler, Georg; Hansen, Guenter; and Schulte, Wolfgang, to BASF Aktiengesellschaft. Trisazo dye. 4,479,906, Cl. 260-169.000.
Zeitz, Vernon. Valveless, positive displacement pump. 4,479,759, Cl. 417-500.000.
Zenith Electronics Corporation: *See*—
Dobrovolny, Pierre, 4,480,338, Cl. 455-188.000.
Zeria Shinyaku Kogyo Kabushiki Kaisha: *See*—
Sato, Hiroshi; Sasaki, Koji; Takagi, Kaname; Hiratani, Hajime; and Yuki, Yoshikazu, 4,479,937, Cl. 424-99.000.
Ziegler, Paul. Process for continuous wet treatment of textile materials. 4,479,276, Cl. 8-152.000.
Zielinski, Robert J.: *See*—
Korczykowski, Lawrence L.; and Zielinski, Robert J., 4,479,873, Cl. 210-91.000.
Zierold, Martin K.: *See*—
Haynes, Richard; Jackson, Anna M.; and Zierold, Martin K., 4,479,922, Cl. 423-22.000.
Zimmer, Inc.: *See*—
Bolesky, Richard C.; Farling, Gene M.; and Gold, Barry L., 4,479,271, Cl. 3-1.911.
Zimmerman, Daniel: *See*—
Natarajan, Kavilipalayam; and Zimmerman, Daniel, 4,480,071, Cl. 524-593.000.
Zin-Plas Corporation: *See*—
Evans, Frank C.; and Nelson, Merritt J., 4,479,736, Cl 403-287.000.
Zinnen, Hermann A.: *See*—
Priegnitz, James W.; and Zinnen, Hermann A., 4,480,129, Cl. 564-424.000.
Zoleski, Benjamin H.; and Sung, Rodney L., to Texaco Inc. Marine diesel cylinder oils containing polyalkoxylated phenoxy compounds for improved spreadability. 4,479,882, Cl. 252-33.400.
Zweifel, Hans: *See*—
Fischer, Walter; Kvita, Vratislav; and Zweifel, Hans, 4,480,105, Cl. 549-243.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF OCTOBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blake, John J.: *See*—
DeFreitas, Richard E.; and Blake, John J., Re. 31,720, Cl. 375-30.000.

Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, to Celamerck GmbH & Co. KG. 2-Chloro-3-(phenoxy or phenylthio)-6-nitro-anilines. Re. 31,717, Cl. 71-98.000.

Celamerck GmbH & Co. KG: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, Re. 31,717, Cl. 71-98.000.

Coates, David; Gray, George W.; and McDonnell, Damien G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compounds. Re. 31,715, Cl. 350-346.000.

DeFreitas, Richard E.; and Blake, John J., to DeltaLab Research, Inc. Digital encoding circuitry. Re. 31,720, Cl. 375-30.000.

DeltaLab Research, Inc.: *See*—
DeFreitas, Richard E.; and Blake, John J., Re. 31,720, Cl. 375-30.000.

Erikson, Keith W.; and Erikson, Kenneth W. Anti-backlash nut assembly. Re. 31,713, Cl. 74-441.000.

Erikson, Kenneth W.: *See*—
Erikson, Keith W.; and Erikson, Kenneth W., Re. 31,713, Cl. 74-441.000.

Gray, George W.: *See*—
Coates, David; Gray, George W.; and McDonnell, Damien G., Re. 31,715, Cl. 350-346.000.

Huang, Hann S.: *See*—
Winnick, Jack; Sather, Norman F.; and Huang, Hann S., Re. 31,718, Cl. 204-130.000.

Kimura, Kunio: *See*—
Sonetaka, Kazunori; Nishino, Atsushi; and Kimura, Kunio, Re. 31,719, Cl. 502-63.000.

Knickerbocker, Robert H., to Siemon Company, The. Pre-wired terminal connecting block. Re. 31,714, Cl. 339-97.00P.

Lee, Robert L. Dental apparatus. Re. 31,716, Cl. 433-56.000.

Linden, Gerbert: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, Re. 31,717, Cl. 71-98.000.

Lust, Sigmund: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, Re. 31,717, Cl. 71-98.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Sonetaka, Kazunori; Nishino, Atsushi; and Kimura, Kunio, Re. 31,719, Cl. 502-63.000.

McDonnell, Damien G.: *See*—
Coates, David; Gray, George W.; and McDonnell, Damien G., Re. 31,715, Cl. 350-346.000.

Nishino, Atsushi: *See*—
Sonetaka, Kazunori; Nishino, Atsushi; and Kimura, Kunio, Re. 31,719, Cl. 502-63.000.

Sather, Norman F.: *See*—
Winnick, Jack; Sather, Norman F.; and Huang, Hann S., Re. 31,718, Cl. 204-130.000.

Sehring, Richard: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, Re. 31,717, Cl. 71-98.000.

Siemon Company, The: *See*—
Knickerbocker, Robert H., Re. 31,714, Cl. 339-97.00P.

Sonetaka, Kazunori; Nishino, Atsushi; and Kimura, Kunio, to Matsushita Electric Industrial Co., Ltd. Supported catalyst for purifying gas and method of manufacturing the same. Re. 31,719, Cl. 502-63.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Coates, David; Gray, George W.; and McDonnell, Damien G., Re. 31,715, Cl. 350-346.000.

United States of America
Energy: *See*—
Winnick, Jack; Sather, Norman F.; and Huang, Hann S., Re. 31,718, Cl. 204-130.000.

Winnick, Jack; Sather, Norman F.; and Huang, Hann S., to United States of America, Energy. Electrochemical separation and concentration of hydrogen sulfide from gas mixtures. Re. 31,718, Cl. 204-130.000.

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# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Hannan, John I., to Phillips Stamping Co., Inc. Load supporting bearing plate. B1 4,037,418, 10-30-84, Cl. 405-259.000.

Lucas Industries Limited: *See*—
Lumby, Roland J.; North, Bernard; and Taylor, Alfred J., B1 4,127,416, Cl. 501-98.000.

Lumby, Roland J.; North, Bernard; and Taylor, Alfred J., to Lucas Industries Limited. Method of producing a ceramic product. B1 4,127,416, 10-30-84, Cl. 501-98.000.

North, Bernard: *See*—
Lumby, Roland J.; North, Bernard; and Taylor, Alfred J., B1 4,127,416, Cl. 501-98.000.

Phillips Stamping Co., Inc.: *See*—
Hannan, John I., B1 4,037,418, Cl. 405-259.000.

Taylor, Alfred J.: *See*—
Lumby, Roland J.; North, Bernard; and Taylor, Alfred J., B1 4,127,416, Cl. 501-98.000.

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# LIST OF DESIGN PATENTEES

Alco Foodservice Equipment Company: *See*—
Kalloch, Anthony L.; Schneider, William C.; and Carville, James G., 276,121, Cl. D7-330.000.

Allen, Robert K.; Toth, Steven; and Windslow, David, to American Greetings Corporation. Toy trolley. 276,173, 10-30-84, Cl. D21-129.000.

American Greetings Corporation: *See*—
Allen, Robert K.; Toth, Steven; and Windslow, David, 276,173, Cl. D21-129.000.

American Standard Inc.: *See*—
Kaiser, Jack N., 276,176, Cl. D23-65.000.

AMIET AG: *See*—
Gisiger, Urs, 276,130, Cl. D8-330.000.

Anderle, Joseph A.; Debs, Victor; and Toledo, Manuel, to Levolor Lorentzen, Inc. Weight for venetian blind cords. 276,113, 10-30-84, Cl. D6-581.000.

Anderson, Gary D. Window pulley seal. 276,133, 10-30-84, Cl. D8-349.000.

Andover Controls Corporation: *See*—
Ault, Charles M.; and Landry, Steven G., 276,152, Cl. D13-35.000.
Arcoflex S.p.A.: *See*—
Vitaloni, Massimo, 276,151, Cl. D13-32.000.
Arima, Juichi, to Arima Marine International, Inc. Boat. 276,147, 10-30-84, Cl. D12-314.000.
Arima Marine International, Inc.: *See*—
Arima, Juichi, 276,147, Cl. D12-314.000.
Armbruster, Joseph M. Air circulator. 276,182, 10-30-84, Cl. D23-151.000.
Atlas Electronics Manufacturing Limited: *See*—
Lee, C. C.; Louie, D. H.; and Tam, Y. M., 276,158, Cl. D14-68.000.
Ault, Charles M.; and Landry, Steven G., to Andover Controls Corporation. Controller housing. 276,152, 10-30-84, Cl. D13-35.000.
Avon Tyres Limited: *See*—
Walker, Peter J., 276,145, Cl. D12-136.000.
Baker, Hollis D.: *See*—
Gordon, Michael D.; and Baker, Hollis D., 276,109, Cl. D6-338.000.
Bandai Co., Ltd.: *See*—
Murakami, Katsushi, 276,172, Cl. D21-128.000.
Banta, C. C. Bass marimba. 276,167, 10-30-84, Cl. D17-23.000.
Basil, Mario E. Compartmented tray and cover for food or the like. 276,116, 10-30-84, Cl. D7-16.000.
Battle, David, to Visual Information Institute, Inc. Desk tray for holding note paper. 276,169, 10-30-84, Cl. D19-92.000.
Blair, John J.; and Eden, George T., to Dentsply Research & Development Corp. Dental metallic casting ingot. 276,164, 10-30-84, Cl. D15-144.000.
Bowers, James B., to H and H Promotions, Inc. Display case. 276,108, 10-30-84, Cl. D6-470.000.
Brentini, Attilio. Key-holder. 276,096, 10-30-84, Cl. D3-61.000.
Buehler, Charles F. Fireplace insert with interchangeable door panels. 276,179, 10-30-84, Cl. D23-94.000.
Buehler, Charles F. Fireplace insert with interchangeable door panels. 276,180, 10-30-84, Cl. D23-94.000.
Canon Kabushiki Kaisha: *See*—
Masaki, Nobuo, 276,166, Cl. D16-31.000.
Carville, James G.: *See*—
Kalloch, Anthony L.; Schneider, William C.; and Carville, James G., 276,121, Cl. D7-330.000.
Chow, Ho; and Perry, Gordon R., to Melnor Industries, Inc. Pulsator head for a sprinkler. 276,174, 10-30-84, Cl. D23-7.000.
Christian, Donald K. Coin mechanism enclosure for a newspaper vendor. 276,170, 10-30-84, Cl. D20-6.000.
Clark, Henry B., Jr.: *See*—
Marshall, John; and Clark, Henry B., Jr., 276,150, Cl. D13-30.000.
Cohen, Morris. Sandal. 276,094, 10-30-84, Cl. D2-270.000.
Comet Products, Inc.: *See*—
Wiedeman, Robert L., 276,115, Cl. D7-14.000.
Cone, Richard E., to Questor Corporation. Booster seat. 276,098, 10-30-84, Cl. D6-333.000.
Cone, Richard E., to Questor Corporation. Booster seat. 276,099, 10-30-84, Cl. D6-333.000.
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., to Dart Industries Inc. Casserole dish or the like. 276,114, 10-30-84, Cl. D7-1.000.
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., to Dart Industries Inc. Dish cover or the like. 276,118, 10-30-84, Cl. D7-40.000.
Daenen, Robert H. C. M.: *See*—
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,114, Cl. D7-1.000.
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,118, Cl. D7-40.000.
Dart Industries Inc.: *See*—
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,114, Cl. D7-1.000.
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,118, Cl. D7-40.000.
Goodin, John W.; and Patterson, Charlie A., 276,156, Cl. D14-53.000.
Debs, Victor: *See*—
Anderle, Joseph A.; Debs, Victor; and Toledo, Manuel, 276,113, Cl. D6-581.000.
Dentsply Research & Development Corp.: *See*—
Blair, John J.; and Eden, George T., 276,164, Cl. D15-144.000.
Design Institute America, Inc.: *See*—
Mulhauser, George C., 276,102, Cl. D6-361.000.
Ditgen, Earl N. Toothpaste dispenser. 276,097, 10-30-84, Cl. D4-108.000.
Dobrin, Alvin R., to Electro-General Plastics Corp. Highway barrel. 276,142, 10-30-84, Cl. D10-106.000.
Doman, Donald W., to Kohler Co. Dryer. 276,178, 10-30-84, Cl. D23-74.000.
Doyel, John S. File drawer. 276,111, 10-30-84, Cl. D6-510.000.
Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 276,187, Cl. D26-139.000.
Eckmann, John A.; and Scheid, William J., to Motorola, Inc. Battery charger or similar article. 276,149, 10-30-84, Cl. D13-5.000.
Eden, George T.: *See*—
Blair, John J.; and Eden, George T., 276,164, Cl. D15-144.000.
Electro-General Plastics Corp.: *See*—
Dobrin, Alvin R., 276,142, Cl. D10-106.000.
Emerson Electric Co.: *See*—
Tuggle, Lloyd H.; Loyd, Ronald C.; and Fain, Charles A., 276,160, Cl. D15-1.000.
Ericsson, Per. Cable clamp. 276,134, 10-30-84, Cl. D8-396.000.
Fain, Charles A.: *See*—
Tuggle, Lloyd H.; Loyd, Ronald C.; and Fain, Charles A., 276,160, Cl. D15-1.000.
Fayle, Paul R. Sliding door and window lock. 276,131, 10-30-84, Cl. D8-330.000.
Fehlbaum & Co.: *See*—
Muller-Deisig, Wolfgang, 276,101, Cl. D6-366.000.
Ferrell, Linda S.; and Roberts, Janet S. Hospital bed protective device. 276,112, 10-30-84, Cl. D6-503.000.
Filipowicz, Andrew J., to Filipowicz, Andrew J. Novelty toy. 276,171, 10-30-84, Cl. D21-59.000.
Fraser, Ian B.; and Whitbread, David A., to HMC-Brauer Limited. Toggle clamp. 276,126, 10-30-84, Cl. D8-72.000.
Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See*—
Ramsey, Roger H.; and Panasewicz, Dale A., 276,163, Cl. D15-69.000.
Frost, George H.: *See*—
Hayes, Robert R.; and Frost, George H., 276,129, Cl. D8-90.000.
General Electric Company: *See*—
Huntington, Robert R., 276,159, Cl. D14-72.000.
Gisiger, Urs, to AMIET AG. Lock for luggage or similar type carrying container. 276,130, 10-30-84, Cl. D8-330.000.
Goodin, John W.; and Patterson, Charlie A., to Dart Industries Inc. Combination telephone, remote control device, and security device. 276,156, 10-30-84, Cl. D14-53.000.
Goodyear Tire & Rubber Company, The: *See*—
Wolfe, Merritt W., 276,146, Cl. D12-142.000.
Gordon, Michael D.; and Baker, Hollis D., to Rota Development Company. Examination table and chair combination or similar article. 276,109, 10-30-84, Cl. D6-338.000.
Greenlee, Hugh T.: *See*—
Wright, Richard B.; and Greenlee, Hugh T., 276,125, Cl. D8-25.000.
Grosfillex, Raymond, to Grosfillex S.A.R.L. Folding chair. 276,106, 10-30-84, Cl. D6-368.000.
Grosfillex, Raymond, to Grosfillex S.A.R.L. Folding chair. 276,107, 10-30-84, Cl. D6-368.000.
Grosfillex S.A.R.L.: *See*—
Grosfillex, Raymond, 276,106, Cl. D6-368.000.
Grosfillex, Raymond, 276,107, Cl. D6-368.000.
Grusin, Gerald M.: *See*—
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,114, Cl. D7-1.000.
Conti, Rino; Daenen, Robert H. C. M.; Grusin, Gerald M.; Picozza, Augusto A.; and Swett, James B., 276,118, Cl. D7-40.000.
H and H Promotions, Inc.: *See*—
Bowers, James B., 276,108, Cl. D6-470.000.
Hall, Alfred E.: *See*—
Pyles, Donald L., 276,123, Cl. D8-17.000.
Harada, Toshio: *See*—
Tanaka, Michio; Matsushima, Hisatoshi; Mizuma, Kensuke; and Harada, Toshio, 276,122, Cl. D7-351.000.
Hayes, Robert R.; and Frost, George H., to Oatey Co. Hand file. 276,129, 10-30-84, Cl. D8-90.000.
Heweston, David I. Collapsible insulating container. 276,119, 10-30-84, Cl. D7-70.000.
HMC-Brauer Limited: *See*—
Fraser, Ian B.; and Whitbread, David A., 276,126, Cl. D8-72.000.
Huntington, Robert R., to General Electric Company. Portable radio transceiver or the like. 276,159, 10-30-84, Cl. D14-72.000.
Idea Works, Inc., The: *See*—
Sharpe, Stephen N., 276,141, Cl. D10-45.000.
Iijima, Takekazu, to Pioneer Electronic Corporation. Loudspeaker. 276,153, 10-30-84, Cl. D14-30.000.
Irvine, Robert M.: *See*—
Vere, Mary A.; Nelson, John; and Irvine, Robert M., 276,137, Cl. D9-337.000.
Johnson & Johnson Baby Products Company: *See*—
Vere, Mary A.; Nelson, John; and Irvine, Robert M., 276,137, Cl. D9-337.000.
Kaiser, Jack N., to American Standard Inc. Water closet or similar article. 276,176, 10-30-84, Cl. D23-65.000.
Kalloch, Anthony L.; Schneider, William C.; and Carville, James G., to Alco Foodservice Equipment Company. Toaster. 276,121, 10-30-84, Cl. D7-330.000.
Katz, Stanley H. Coin tray or similar article. 276,168, 10-30-84, Cl. D18-3.000.
Keeler, Robert A., to Steelcase Inc. Sled based arm chair. 276,104, 10-30-84, Cl. D6-372.000.
Kimberly-Clark Corporation: *See*—
Whitehead, Howard A., 276,183, Cl. D24-51.000.
Whitehead, Howard A., 276,184, Cl. D24-51.000.
Kimstock, Inc.: *See*—
McMillan, Gloria K.; and Schmidt, William J., 276,175, Cl. D23-57.000.
Kohler Co.: *See*—
Doman, Donald W., 276,178, Cl. D23-74.000.
Kojima, Yoshio: *See*—
Nanba, Masumi; and Kojima, Yoshio, 276,186, Cl. D26-3.000.
Landry, Steven G.: *See*—
Ault, Charles M.; and Landry, Steven G., 276,152, Cl. D13-35.000.
Lee, C. C.; Louie, D. H.; and Tam, Y. M., to Atlas Electronics Manufacturing Limited. Portable stereo receiver housing. 276,158, 10-30-84, Cl. D14-68.000.

Lee, Peter, to Pioneer Hand Tools Industrial Co. Collapsible screwdriver. 276,127, 10-30-84, Cl. D8-84.000.
Lee, Peter, to Pioneer Hand Tools Industrial Co. Screwdriver. 276,128, 10-30-84, Cl. D8-84.000.
Lenox, Incorporated: *See*—
Solt, Charles, 276,117, Cl. D7-36.000.
Levine, Harold: *See*—
Pyles, Donald L., 276,123, Cl. D8-17.000.
Levolor Lorentzen, Inc.: *See*—
Anderle, Joseph A.; Debs, Victor; and Toledo, Manuel, 276,113, Cl. D6-581.000.
Liu, Chin-Lang. Multi-use handle tool. 276,124, 10-30-84, Cl. D8-22.000.
Loeb, Warner. Combination window lock and installation gauge. 276,132, 10-30-84, Cl. D8-331.000.
Louie, D. H.: *See*—
Lee, C. C.; Louie, D. H.; and Tam, Y. M., 276,158, Cl. D14-68.000.
Loyd, Ronald C.: *See*—
Tuggle, Lloyd H.; Loyd, Ronald C.; and Fain, Charles A., 276,160, Cl. D15-1.000.
Marshall, Eric J., to Marshall Telephone Corporation Limited, The. Telephone. 276,157, 10-30-84, Cl. D14-53.000.
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140 4,479,533
142 4,479,534
4,479,535
145 4,479,536

### CLASS 166

77 4,479,537
173 4,479,538
212 4,479,539
260 4,479,540
268 4,479,541
273 4,479,542
290 4,479,544
300 4,479,543
318 4,479,545
369 4,479,546
383 4,479,547
387 4,479,548

### CLASS 172

142 4,479,549
311 4,479,554

### CLASS 173

112 4,479,550
119 4,479,551
139 4,479,552
168 4,479,553
171 4,479,555

### CLASS 174

3 4,480,146
14 R 4,480,147
42 4,480,149
51 4,480,148
52 FP 4,480,150
153 R 4,480,151

### CLASS 175

4.6 4,479,556
59 4,479,557
320 4,479,558

### CLASS 177

1 4,479,559
147 4,479,560
154 4,479,561
256 4,479,562

### CLASS 179

81 R 4,480,152
84 C 4,480,154
84 T 4,480,153
115.5 FV 4,480,155
170.2 4,480,156

### CLASS 180

6.7 4,479,563

### CLASS 181

105 4,479,564

### CLASS 187

29 R 4,479,565

### CLASS 188

1.12 4,479,566
47 4,479,567

### CLASS 191

34 4,480,157

### CLASS 192

67 R 4,479,568
70.20 4,479,569
85 AA 4,479,570
129 A 4,479,571

### CLASS 198

345 4,479,572
399 4,479,573
626 4,479,574
735 4,479,575
774 4,479,576

### CLASS 200

34 4,480,158
42 T 4,480,159
82 R 4,480,160
144 R 4,480,161
181 4,480,162
331 4,480,163

### CLASS 203

80 4,479,851

### CLASS 204

1 T 4,479,852
5 4,479,853
12 4,479,854
16 4,479,855
55 R 4,479,856
130 Re.31,718
4,479,857
158 R 4,479,858
4,479,859
159.11 4,479,860
180 G 4,479,861

192 R 4,479,862
279 4,479,863
290 F 4,479,864
415 4,479,865
425 4,479,866
426 4,479,867
4,479,868

CLASS 206
45.18 4,479,577
221 4,479,578
309 4,479,579
387 4,479,580

CLASS 208
130 4,479,869
164 4,479,870
340 4,479,871

CLASS 209
3 4,479,581
258 4,479,872
552 4,479,582

CLASS 210
91 4,479,873
443 4,479,874
519 4,479,875
605 4,479,876
670 4,479,877
699 4,479,878
727 4,479,879
795 4,479,880

CLASS 211
49 D 4,479,583
89 4,479,584

CLASS 215
218 4,479,585
258 4,479,586

CLASS 219
10.55 B 4,480,164
85 R 4,480,165
118 4,480,166
119 4,480,167
121 L 4,480,168
121 LH 4,480,169
125.1 4,480,170
136 4,480,171
305 4,480,172
312 4,480,173
331 4,480,174
345 4,480,175
461 4,480,176

CLASS 220
89 A 4,479,587
416 4,479,588

CLASS 222
146.5 4,479,590
153 4,479,589
317 4,479,591
319 4,479,592
321 4,479,593
597 4,479,594

CLASS 234
211 4,479,595
236 4,479,596

CLASS 225
100 4,479,597

CLASS 226
74 4,479,598

CLASS 227
9 4,479,599
48 4,479,600
130 4,479,601

CLASS 228
48 4,479,602
155 4,479,603

CLASS 235
379 4,480,177
380 4,480,178
473 4,480,179
475 4,480,180
486 4,480,181

CLASS 236
49 4,479,604

CLASS 237
8 R 4,479,605
67 4,479,606

CLASS 238
349 4,479,607

CLASS 239
7 4,479,608
102 4,479,609
171 4,479,610
205 4,479,611
280 4,479,612

CLASS 241
48 4,479,613
82.2 4,479,614

CLASS 243
68.4 4,479,615
84.1 J 4,479,616
167 4,479,617
200 4,479,618

CLASS 244
60 4,479,619
75 R 4,479,620
117 R 4,479,621
129.5 4,479,622
4,479,623
152 4,479,624

CLASS 248
74.1 4,479,625
406.2 4,479,627
420 4,479,626
530 4,479,628

CLASS 249
53 R 4,479,629
142 4,479,630

CLASS 250
227 4,480,182
4,480,183
4,480,184
251 4,480,185
268 4,480,186
296 4,480,187
306 4,480,188
337 4,480,189
343 4,480,190
4,480,191
550 4,480,192

CLASS 251
24 4,479,631
328 4,479,670

CLASS 252
8.55 D 4,479,894
8.8 4,479,881
32.7 E 4,479,883
33.4 4,479,882
132 4,479,884
299.62 4,479,885
301.4 R 4,479,886
309 4,479,887
357 4,479,888
365 4,479,889
508 4,479,890
512 4,479,891
514 4,479,892
542 4,479,893

CLASS 254
3 B 4,479,632
93 R 4,479,633
133 R 4,479,634
350 4,479,635

CLASS 256
35 4,479,636

CLASS 260
112 B 4,479,895
4,479,896
112.5 R 4,479,897
4,479,898
169 4,479,906
205 4,479,899
239 A 4,479,900
239 BD 4,479,901
409 4,479,902
455 A 4,479,903
465 E 4,479,904
467 4,479,905

CLASS 261
18 A 4,479,907
62 4,479,908
97 4,479,909

CLASS 264
2.5 4,479,910
4.6 4,479,911
23 4,479,912
29.5 4,479,913
45.5 4,479,914
249 4,479,915
263 4,479,916

CLASS 266
281 4,479,637

CLASS 267
64.17 4,479,638

CLASS 269
6 4,479,639

CLASS 270
32 4,479,640
53 4,479,641
4,479,642
55 4,479,643

CLASS 271
107 4,479,644
183 4,479,645

CLASS 272
73 4,479,646
117 4,479,647

CLASS 273
54 B 4,479,648
61 R 4,479,649
86 B 4,479,650
157 R 4,479,651
172 4,479,652
183 B 4,479,653
271 4,479,654
425 4,479,655

CLASS 277
135 4,479,656

CLASS 280
8 4,479,657
47.31 4,479,658
226 R 4,479,659
261 4,479,660
279 4,479,661
281 R 4,479,662
289 H 4,479,663
618 4,479,664
644 4,479,665

CLASS 285
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39 4,479,667
137 R 4,479,668
332.3 4,479,669

CLASS 292
169.14 4,479,671

CLASS 294
1 CA 4,479,672
88 4,479,673
147 4,479,674

CLASS 296
37.16 4,479,675
78.1 4,479,676
98 4,479,677

CLASS 297
71 4,479,678
300 4,479,679

CLASS 299
14 4,479,680

CLASS 307
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132 E 4,480,194
140 4,480,195
200 A 4,480,196
252 N 4,480,197
269 4,480,198
303 4,480,199
354 4,480,200
570 4,480,201

CLASS 308
5 R 4,479,681

CLASS 310
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42 4,480,203
68 R 4,480,204
77 4,480,205
90 4,480,206
156 4,480,207
194 4,480,208
313 B 4,480,209

CLASS 312
330 R 4,479,684

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4 4,480,210
70 4,480,211
71 4,480,212
248 4,480,213
290 4,480,214

CLASS 318
306 4,480,215
331 4,480,216
618 4,480,217
696 4,480,218
729 4,480,219

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71.3 4,480,220
96 4,480,221
126 4,480,222
158 P 4,480,223
207 4,480,224
238 4,480,225
247 4,480,226
303 4,480,227
309 4,480,228

CLASS 330
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255 4,480,230
261 4,480,231

CLASS 331
1 A 4,480,232
56 4,480,233
82 4,480,234
91 4,480,235

CLASS 333
174 4,480,236
193 4,480,237
202 4,480,238
219 4,480,239
246 4,480,240

CLASS 335
17 4,480,241
194 4,480,242
202 4,480,243

CLASS 337
171 4,480,244
180 4,480,245
348 4,480,246
407 4,480,247

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32 R 4,480,248

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22 B 4,479,687
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59 M 4,479,691
89 M 4,479,689
94 C 4,479,690
97 P Re.31,714
99 R 4,479,692
119 R 4,479,693
266 R 4,479,694

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568 4,480,250
604 4,480,251
632 4,480,252
825.69 4,480,253

CLASS 343
708 4,480,254
844 4,480,255
909 4,480,256

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107 R 4,480,257
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4,480,302
140 R 4,480,259
208 4,480,052
209 4,480,260

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96.20 4,479,696
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96.23 4,479,702
99 4,479,699
346 Re.31,715
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74 4,480,262

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140 4,480,267
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209 4,480,269
310 4,480,270
4,480,271

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19.1 4,480,273
31 4,480,274
46 4,480,275
4,480,276
69 4,480,277
73 4,480,278
78 4,480,279
4,480,280
104 4,480,281
135 4,480,282

CLASS 361
76 4,480,283
234 4,480,284
306 4,480,285
314 4,480,286
388 4,480,287
398 4,480,288
403 4,480,289
433 4,480,290

CLASS 362
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95 4,480,292
108 4,480,293
184 4,480,294
206 4,480,295
211 4,480,296

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28 4,480,298
41 4,480,299
134 4,480,300
137 4,480,301

CLASS 364
138 4,480,303
200 4,480,304
4,480,305
4,480,306
4,480,307
4,480,308
426 4,480,309
450 4,480,310
527 4,480,311
557 4,480,312
565 4,480,313
900 4,480,314
4,480,315
4,480,316
4,480,317

CLASS 365
104 4,480,318
155 4,480,319
189 4,480,320
4,480,321

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130 4,479,719
214 4,479,720
327 4,479,721

CLASS 367
123 4,480,322
131 4,480,323
150 4,480,324

CLASS 368
17 4,479,722
157 4,479,723
291 4,479,724
292 4,479,725

CLASS 369
122 4,480,325
173 4,480,326

CLASS 370
27 4,480,327
63 4,480,328
110.2 4,480,330

CLASS 371
20 4,480,329

CLASS 372
45 4,480,331

CLASS 374
1 4,479,726
45 4,479,727

CLASS 375
30 Re.31,720

CLASS 378
87 4,480,332

CLASS 381
71 4,480,333

CLASS 384
369 4,479,728
475 4,479,682
619 4,479,683

CLASS 400
195.1 4,479,729
208 4,479,730
320 4,479,731

CLASS 401
107 4,479,732

CLASS 402
79 4,479,733

CLASS 403
4 4,479,734
28 4,479,735
287 4,479,736
382 4,479,737
407 4,479,738

CLASS 404
99 4,479,739

CLASS 405
30 4,479,740
163 4,479,741
217 4,479,742
259 B1 4,037,418

CLASS 406
193 4,479,743

CLASS 407
114 4,479,744

CLASS 409
12 4,479,745

CLASS 410
21 4,479,746

CLASS 411
8 4,479,747
412 4,479,748

CLASS 414
291 4,479,749
392 4,479,750
406 4,479,751
462 4,479,752
541 4,479,753
728 4,479,754

CLASS 415
1 4,479,755
53 T 4,479,756

CLASS 416
186 R 4,479,757

CLASS 417
299 4,479,764
380 4,479,765
388 4,479,758
395 4,479,760
4,479,761
4,479,762
500 4,479,759

CLASS 418
144 4,479,763

CLASS 422
16 4,479,917
112 4,479,918
127 4,479,919
143 4,479,920
180 4,479,921

CLASS 423
22 4,479,922
320 4,479,923
321 R 4,479,924
359 4,479,925
467 4,479,926
481 4,479,927
574 R 4,479,928
575 4,479,929

**CLASS 424**

1.1 4,479,930
4,479,931
9 4,479,932
81 4,479,933
85 4,479,934
92 4,479,935
93 4,479,936
99 4,479,937
101 4,479,938
172 4,479,939
177 4,479,940
4,479,941
180 4,479,942
4,479,943
4,479,944
184 4,479,945
200 4,479,946
203 4,479,947
248.4 4,479,948
4,479,949
248.5 4,479,950
248.57 4,479,951
250 4,479,952
4,479,953
251 4,479,954
4,479,955
253 4,479,956
262 4,479,957
266 4,479,958
269 4,479,959
270 4,479,960
4,479,961
273 N 4,479,962
274 4,479,963
278 4,479,964
279 4,479,965
305 4,479,966
313 4,479,967
330 4,479,968

**CLASS 425**

72 R 4,479,766
186 4,479,767
192 R 4,479,768
434 4,479,769
503 4,479,770
4,479,771
526 4,479,772

**CLASS 426**

3 4,479,969
253 4,479,970
330 4,479,971
536 4,479,972
573 4,479,973
590 4,479,974
4,479,975
607 4,479,976
609 4,479,977
636 4,479,978

**CLASS 427**

9 4,479,979
10 4,479,980
27 4,479,981
41 4,479,982
54.1 4,479,983
4,479,984
164 4,479,985
295 4,479,986
402 4,479,987

**CLASS 428**

34 4,479,988
35 4,479,989
36 4,479,990
76 4,479,991
116 4,479,992
193 4,479,993
195 4,479,994
203 4,479,995
212 4,479,996
4,479,997
220 4,479,998
245 4,479,999
284 4,480,000
4,480,001
329 4,480,003
4,480,004
336 4,480,005
343 4,480,006
379 4,480,007
402.2 4,480,002
425.8 4,430,008
447 4,480,009
457 4,480,010
474.4 4,480,011
506 4,480,012
616 4,480,013
672 4,480,014
677 4,480,015
678 4,480,016

**CLASS 429**

38 4,480,017
160 4,480,018

**CLASS 430**

58 4,480,019
81 4,480,020
106.6 4,480,021
119 4,480,022
124 4,480,023
139 4,480,024
206 4,480,025
510 4,480,026
523 4,480,027
544 4,480,028

**CLASS 431**

9 4,479,773
76 4,479,774
353 4,479,775

**CLASS 432**

144 4,479,776
179 4,479,777
180 4,479,778

**CLASS 433**

20 4,479,779
56 Re.31,716
74 4,479,780
90 4,479,781
220 4,479,782
221 4,479,783

**CLASS 434**

43 4,479,784

**CLASS 435**

5 4,480,029
13 4,480,030
30 4,480,031
68 4,480,032
124 4,480,033
136 4,480,034
168 4,480,035
220 4,480,036
221 4,480,037
261 4,480,038

**CLASS 436**

175 4,480,039
504 4,480,040
508 4,480,041
533 4,480,042
536 4,480,043

**CLASS 441**

75 4,479,785

**CLASS 446**

23 4,479,326
175 4,479,329
237 4,479,328
427 4,479,327

**CLASS 455**

98 4,480,334
188 4,480,338
212 4,480,335
328 4,480,336
333 4,480,337

**CLASS 464**

89 4,479,786

**CLASS 474**

82 4,479,787

**CLASS 494**

27 4,479,788
43 4,479,789
85 4,479,790

**CLASS 501**

4 4,480,044
98 B1 4,127,416
153 4,480,045

**CLASS 502**

35 4,480,046
63 Re.31,719
65 4,480,047
227 4,480,048
231 4,480,049
330 4,480,050
338 4,480,051

**CLASS 521**

54 4,480,053
84.1 4,480,054
106 4,480,055

**CLASS 523**

122 4,480,056
206 4,480,057
404 4,480,058
466 4,480,059
4,480,060

**CLASS 524**

13 4,480,061
394 4,480,062
399 4,480,063
413 4,480,064
418 4,480,065
439 4,480,066
446 4,480,067
456 4,480,068
504 4,480,069
591 4,480,070
593 4,480,071

**CLASS 525**

61 4,480,072
68 4,480,073
194 4,480,074
247 4,480,075
261 4,480,076
530 4,480,077

**CLASS 526**

65 4,480,078
301 4,480,079
318 4,480,080

**CLASS 528**

49 4,480,081
103 4,480,082
111 4,480,083
118 4,480,084
295 4,480,085
295.3 4,480,086
302 4,480,087
353 4,480,088

**CLASS 536**

56 4,480,089
58 4,480,090
59 4,480,091

**CLASS 544**

113 4,480,092
195 4,480,093
222 4,480,094
242 4,480,095
289 4,480,096
296 4,480,097
320 4,480,101

**CLASS 546**

114 4,480,098
164 4,480,099
307 4,480,100
345 4,480,102

**CLASS 548**

365 4,480,103

**CLASS 549**

71 4,480,104
243 4,480,105
253 4,480,106
355 4,480,107
413 4,480,108
441 4,480,109
467 4,480,110
477 4,480,111
478 4,480,112
531 4,480,113
563 4,480,114

**CLASS 560**

1 4,480,115
4,480,117
4 4,480,116
8 4,480,118
151 4,480,119
168 4,480,120
206 4,480,121
239 4,480,122
244 4,480,123
248 4,480,124

**CLASS 564**

144 4,480,125
292 4,480,126
402 4,480,127
424 4,480,128
4,480,129
440 4,480,130
480 4,480,131

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362 4,480,133
385 4,480,134
4,480,135
445 4,480,136
454 4,480,137
4,480,138
680 4,480,139
784 4,480,140
798 4,480,141

**CLASS 585**

465 4,480,142
469 4,480,143
481 4,480,144
640 4,480,145

**CLASS 604**

14 4,479,791
29 4,479,792
53 4,479,795
85 4,479,793
4,479,794
93 4,479,796
153 4,479,797
175 4,479,798
187 4,479,799
4,479,800
4,479,801
238 4,479,802
275 4,479,802

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D3— 35 276,095
61 276,096
D4— 108 276,097
D6— 333 276,098
276,099
338 276,109
361 276,102
364 276,105
366 276,101
368 276,106
276,107
372 276,104
466 276,100
467 276,110
470 276,108
502 276,103
503 276,112
510 276,111
381 276,113
D7— 1 276,114
14 276,115
16 276,116
36 276,117
40 276,118
70 276,119
312 276,120
330 276,121
351 276,122
D8— 17 276,123
22 276,124
25 276,125
72 276,126
84 276,127
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90 276,129
330 276,130
276,131
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349 276,133
386 276,135
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380 276,140
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314 276,147
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32 276,151
35 276,152
D14— 30 276,153
37 276,154
53 276,155
276,156
276,157
68 276,158
72 276,159
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D23— 7 276,174
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276,177
74 276,178
94 276,179
276,180
121 276,181
151 276,182
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D25— 31 276,185
D26— 3 276,186
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P.— 8 5,306
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39 5,308
44 5,309
68 5,310
5,311
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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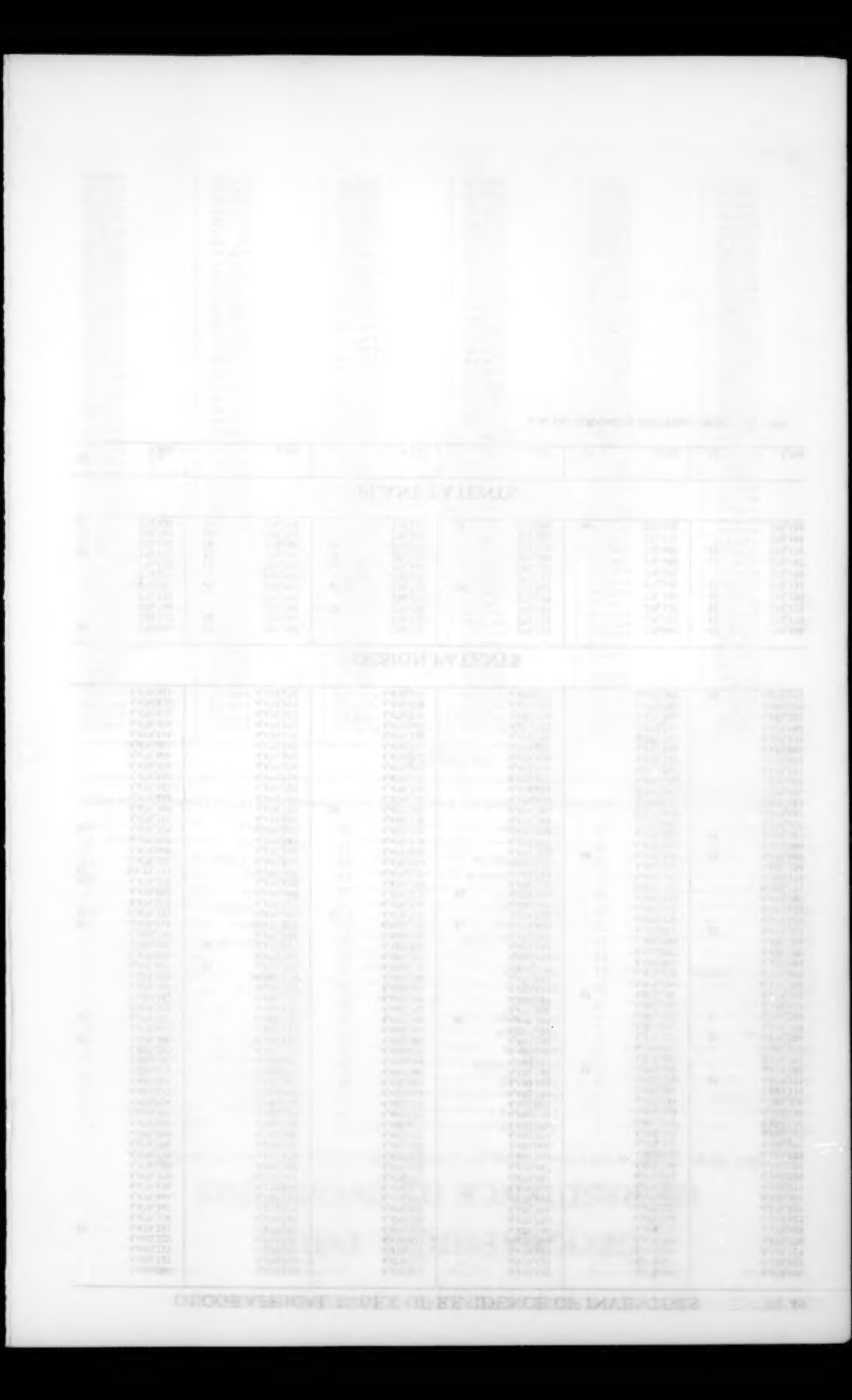

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